Guardall

PX/QX/RX System

Version 4.30

Installation Manual

Issue C

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STATUTORY REQUIREMENTS

Hereby Guardall declares that the RX16i, QX32i, PX48i and the PX80i are in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

If you have any doubts concerning the suitability, connection or uses of this apparatus then consult a suitably qualified person before continuing.

SUITABILITY FOR USE

The apparatus has been designed to work on all European analogue networks and has been independently tested to TBR21. It provides the following facilities:

1. Alarm transmission and transmission/reception of configuration data.
2. Automatic Call Initiation.
3. Series connection.
4. Dial tone Detection
5. Automatic dialling using DTMF tones.
6. Automatic Call Answering.
7. Stored number dialling.
8. Timed Break Register Recall.

It is not suitable for connection to PABX systems or for use as an extension to a payphone.

EN50131 & PD6662 Compliance

PX, QX and RX are suitable for use in systems designed to comply with PD6662:2004. The grade and class of each variant is shown in the table.

Variant	Grade	Class
RX16i/QX32i	2	II
All PX	2 or 3 (Programmable)	II

Refer to the reset options in the engineer programming manual for details on programming the EN grade.

CE Declaration

CE

The products described in this manual conform to the protection requirements of Council Directive 89/336/EEC and 73/23/EEC, as subsequently amended, on the approximation of the laws of Member States relating to Electromagnetic Compatibility and Electrical Equipment designed for use within certain voltage limits.

To comply with this directive it is essential to adhere to the installation recommendations contained in this document.

The equipment is compliant with the requirements of the following:

BS EN61000-6-3:2001	Generic Emission Standard For Residential, Commercial & Light Industry.
EN 50130-4:1995 + A1:1998 + A2:2003	Electromagnetic Compatibility Product Family Standard: Immunity Requirements for Components of Fire, Intruder and Social Alarm Systems.
EN60950:2001	Safety of Information Technology Equipment, including Electrical Business Equipment

Introduction

The installation manual provides the information essential for wiring and operating the system. A full engineer manual (part number W76232) is available from Guardall. Copies of the engineer manual, and all other Guardall manuals, can be downloaded from the Guardall web site at,

www.guardall.com

The documentation section of the Guardall web site is password protected, and you may have to apply for access using the on-line form provided on the site. Alternatively a printed copy of the manual may be obtained by sending a FAX or letter to our Customer Helpline, requesting the full Engineering Manual.

Customer Helpline
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Guardall
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Getting Started

In this manual you will learn how to;

- *Identify the components of the PX system*
- *Connect components together*
- *Make simple configuration changes*

If you are new to the system it is recommended that you connect a basic system “on the bench” and familiarise yourself with programming the panel. Before getting started ensure you have the following components;

- *A control panel*
- *A LCD keypad*
- *A few meters of 4 core cable*
- *A concentrator (optional)*

Now follow these simple steps:

- *Connect +, -, A and B terminals of the keypad (**CN6-XiB**) to the panel XiB **(refer to the appropriate diagram in the panel section of this manual for details)** using a length of 4 core cable. For simplicity of wiring adhere to the following colour coding;*

  + Red
  - Black
  A Yellow
  B Blue

- *Set the address of the concentrator to address 1 (DIL switches 1-6 all off (0))*

- *Connect +, -, A and B terminals of the concentrator (**CN2-XiB**) to the panel XiB connector using a length of 4 core cable using the same colour coding as used for the keypad connections.*

- Connect the mains cable to the fused terminal block and apply power.

The keypad address must be set before it can be used on the system. To set the keypad address, open the case so that the case tamper switch is activated. Press and hold the **?** button until the address prompt is displayed (approximately 4 seconds):

Address = ?? **✓ or ✗**	*If the keypad has not been addressed then the prompt will be **??** or 99. Press ✗ to exit address mode without change.*
Address = 01 **✓ or ✗**	*Press 01 to set the keypad address to 1, then press ✓ to confirm*
00:00 Sat 02 Jan **Guardall**	*The keypad will then display the time/date and company name.*
PX KP Type-n **Version 2.00**	*If the displayed message is as shown, or no bleep is heard, then the keypad is not responding so check the bus connections.*

The keypad types are:

Description	Type
Standard or with proximity reader	1
With 2 EOL circuit inputs	2

Once the keypad is replying then enter the default engineer PIN code, 9999, remembering to validate the PIN code by pressing ✓.

00:00 Sat 02 Jan **Enter-********	*The PIN code digits are displayed as "*" characters.*

Mains

As the system uses hazardous voltages it is recommended that the mains supply connection follow national wiring rules and is carried out by a suitably qualified person. This equipment must be permanently connected to a mains fused spur (3A or 5A). The mains cable should be clamped securely with the cable clamps provided within the equipment/installation kit. Knockouts are provided on the top, bottom and sides of this equipment and these are intended for conduit or cable glands. As a mains switch is not provided on the equipment, a readily accessible disconnect device shall be incorporated in the building installation wiring. Where there is doubt as to the phase of this wiring , the device, when operated, will disconnect both poles simultaneously.

Mains Supply

Item	RX16i/QX32i	PX48i/PX80i	PX500/ PX250HS	3A Smart Concentrator
External power source	230VAC +/- 10%, 50Hz			
Input current rating (AC)	140mA	220mA	260mA	330mA
Mains Fuse	F315mA 250V	F400mA 250V	T630mA 250V	T630mA 250V

Aux. DC Supply

The DC supply output is a Safety Extra-Low Voltage (SELV) circuit. This DC supply rating is for all the DC current requirements, including recharging the battery. The supply has the following rating:

Item	RX16i/ QX32i	PX48i/ PX80i	PX500/ PX250HS	3A Smart Concentrator
Output voltage (DC)	13.8V ± 5%	14V ± 5%	14V ± 0.1V	14V ± 5%
Standby Battery	7Ah	7Ah, 18 Ah	7Ah, 12Ah or 18Ah	2 off 18Ah
Maximum recharge time	24 hours	24 hours	24 hours	24 hours
Power supply rating	1.0A	1.50A	2.5A	3.0A
Battery Charge Limit	0.5A	0.75A	0.78A	0.75A per battery
Quiescent current	85mA	85mA	80mA	100mA
Aux1 DC supply (Fuse 1)	F800mA 250V	F800mA 250V	F800mA 250V	F1.6A 250V
Aux2 DC supply		F800mA 250V (Fuse 2)	F800mA 250V (Fuse 2)	F1.6A 250V (Fuse 2)
XiB Bus DC supply	F800mA 250V (Fuse 4)	F800mA 250V (Fuse 6)	F800mA 250V (Fuses 5,6,7,8)	F800mA 250V (Fuse 5)
Battery	F2.5A 250V (Fuse 2)	F2.5A 250V (Fuse 4)	F2.5A 250V (Fuse 9)	F2.5A 250V (Fuses 3 & 4)
Sounder/Audio/Aux. DC	F800mA 250V (Fuse 4)	F800mA 250V (Fuse 3)	F800mA 250V (Fuses 3 & 4)	

All wiring in this enclosure requires to be V-2, IEC approved or PVC type. All installation wiring within this equipment should utilise plastic cable ties to bundle cables so as to provide strain relief for the cable.

Order Codes

Order Code	Description
W76469	RX16i Control panel (English) v4
W76468	RX16i Control panel (Chubb) v4
W76491	RX16i Control panel (Chubb SA) v4
W76481	QX32i Control panel (English) v4
W76492	QX32i Control panel (Chubb SA) v4
W76511	PX48i Control panel (English) v4
W76483	PX48i Control panel (Chubb) v4
W76475	PX48i Control panel (Chubb RVR) v4
W76484	PX80i Control panel (English) v4
W76493	PX80i Control panel (Chubb SA) v4
W76195	PX500 Control panel (English) v4
W76196	PX500 Control panel (Chubb) v4
W76203	PX250 High Security Control panel (English) v4
W76204	PX250 High Security Control panel (Chubb) v4
W76247	LCD Keypad 2 Line, 2 EOL circuits
W76250	LCD Keypad 2 Line, proximity & 2 EOL circuits
W76251	LCD Keypad 2 Line, 2 EOL circuits (Chubb)
W76254	LCD Keypad 2 Line, proximity & 2 EOL circuits (Chubb)
W76289	Mini Keypad
W73821	Proximity Reader
W73820	Proximity Fob Pack (2 off)
W73837	Proximity Card Pack (10 off)
W76512	Output Module (8 Relay/8 Transistor)
W76068	Serial Module (RS232)
W73869	Bus Isolator
W72951	Guardall Managed Reset PC software
W73538	Pin of the Day PC software
W73534 UK	GuardStation™ Modem
W76546	Programming Kit
W76232	PX Engineer Manual v4 (English)
W73822	Access Module
W73847	Smart Access Module
W73840	GuardStation™ Access
W74334	SmartKey Converter
W74368	Data comms Module (External)
W74369	Data comms Module (Internal)
W76293	GSR Professional v4
W76010	GSR (direct)
W76287	Diagnostic Concentrator 4 Input/2 Output (Plastic)
W74480	Diagnostic Concentrator 8 Input/4 Output (Plastic)
W74481	Universal 4 relay output board

Order Code	Description
W76329	3A Smart Concentrator (8 input/4 output)
W76110	Radio Module (Visonic)
W76067	Radio Module (Inovonics)
W76245	Radio Repeater (Inovonics)
W76094	UTX 2-input with OTW tamper (Inovonics)
W76095	2-button pendant TX (Inovonics)
W76096	2-button belt clip TX (Inovonics)
W76097	Shatter pro TX (Inovonics)
W76098	Smoke detector TX (Inovonics)
W76099	UTX (generic) with OTW tamper (Inovonics)
W76100	Door/Window TX with OTW tamper (Inovonics)
W76101	1-button pendant TX (Inovonics)
W76102	1-button belt clip TX (Inovonics)
W76103	PIR TX (Inovonics)
W76292	2-button TX (ES1238D) (Inovonics)
W76069	Dual Comm Module
W76070	PSTN Module
W76071	GSM Module
W76073	Audio Bus Interface
W76074	Audio Bus Interface/Speech & Record
W76050	Speech module
W76075	TalkBack Module
W76078	Microphone Module
W76076	Microphone
W76210	DGN Interface
W7436	4-channel video server
W7454	1-channel video server

System Components

A system comprises of the following components:

1. A control unit, which processes all the alarm information from the detection points. Outputs are provided to operate sounders, strobe and communication devices. Configuration information is stored in EEPROM. The manual details the features of the control panels. Most features in the PX panel range are common. The differences are shown in the table.

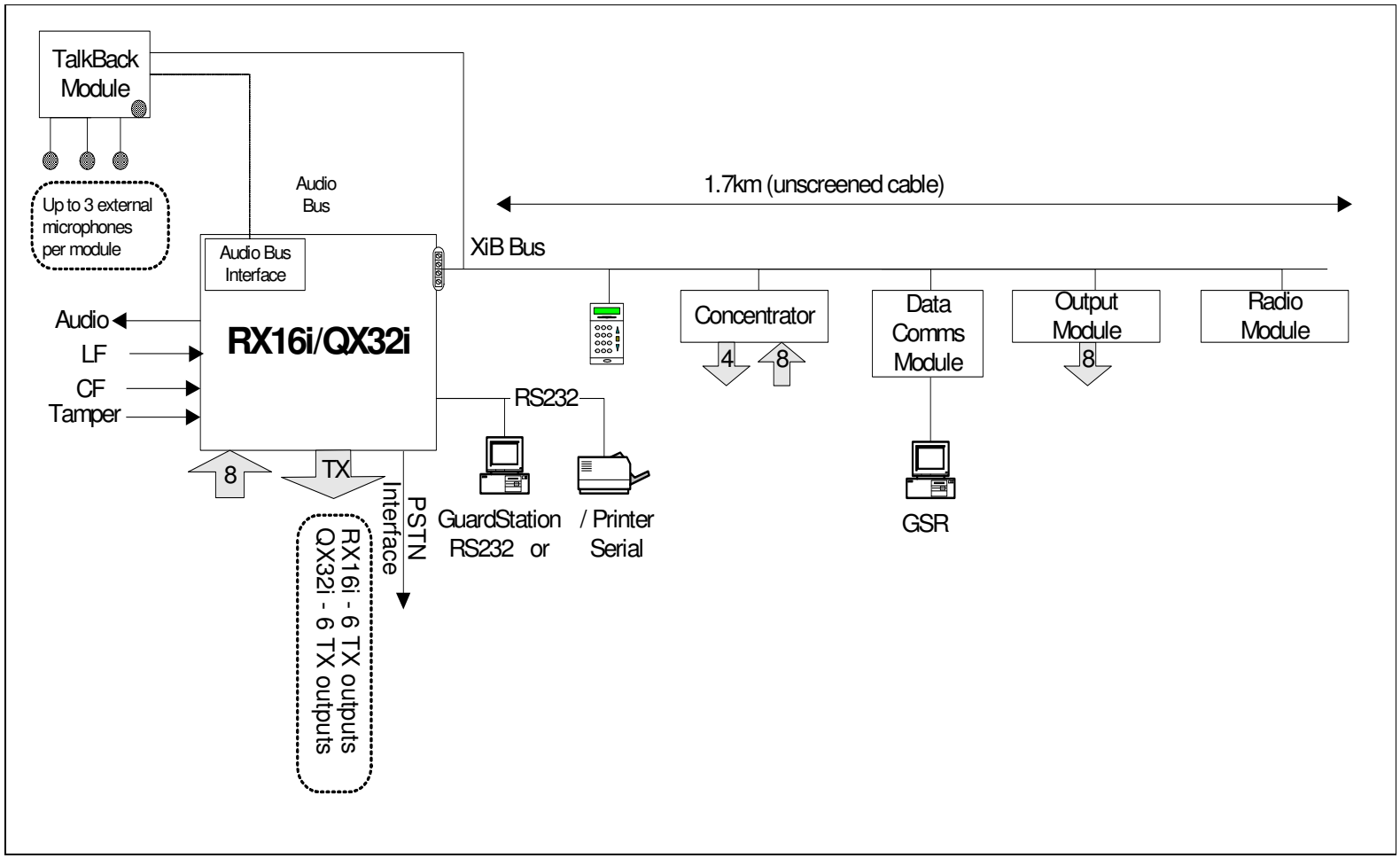
Feature	RX16i	QX32i	PX48i	PX80i	PX500	PX250HS
Max. Circuits	16	32	48	80	512	256
Max Concentrators	2	6	10	18	64	32
Circuit Doubling	✓	✓	✗	✗	✗	✗
XiB Detectors	8	16	24	40	64	64
Max. Panel Users	16	32	50	100	200	200
Max. Access Users	✗	✗	1000	1000	1000	1000
Areas	4	8	8	16	32	16
Set Groups	✗	8	8	16	32	16
Sub systems	✗	4	4	8	16	8
Max Keypads	4	8	8	16	32	16
Output Modules	1	2	8	16	32	32
Output functions	16	16	20	64	128	128
Serial/Data comms Modules	2	2	2	2	2	2
Access Modules	✗	✗	32	32	32	32
Audio Modules	2	4	8	16	32	16
Radio Modules	1	2	4	8	16	8
Max. Transmitters	16	16	24	40	128	128
Video cameras	4	8	32	32	32	32
Responses	2	5	5	10	20	20
Tel Numbers	8	8	8	8	8	8
GSR profiles	1	2	4	4	4	4
Schedules	2	4	32	32	32	32
Holidays	✗	14	14	14	14	20
Event Log Size	250	500	1000	1000	1000	2000
Access Log Size	✗	✗	1000	1000	1000	1000

The diagram on the following page shows the bus peripheral connections.

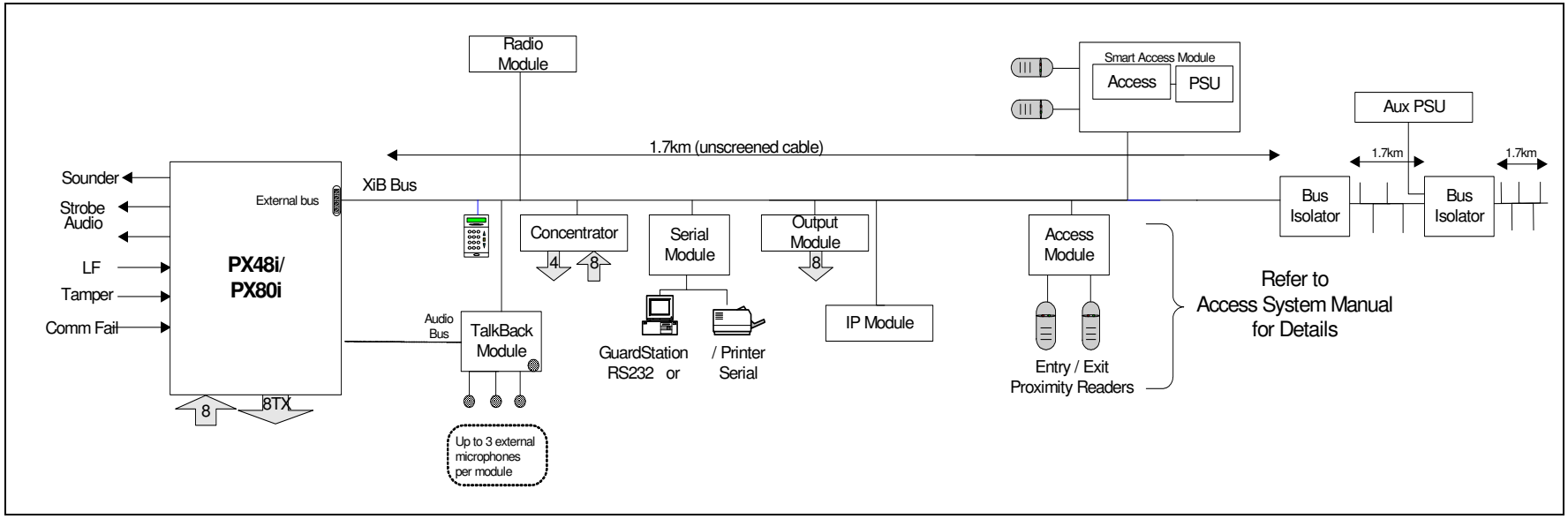
2. User interaction with the system is via LCD keypad. There must be at least 1 keypad on a system. There are several types of LCD keypad available, which are detailed later.
3. On the RX16i, QX32i, PX48i and PX80i, up to 8 detectors may be connected directly to the panel. Further detectors, up to the control panel limit, may be connected to the system through concentrators on a 4-wire bus. Each concentrator provides 8 additional circuits.
4. Optional equipment includes;

    1. A dialler/modem/Dual comm module
    2. Output modules each with 8 programmable outputs
    3. A serial module for connection of a printer or PC
    4. Bus isolator
    5. Access module
    6. Data comms module for an Ethernet connection to a PC
    7. Radio module
    8. Audio module

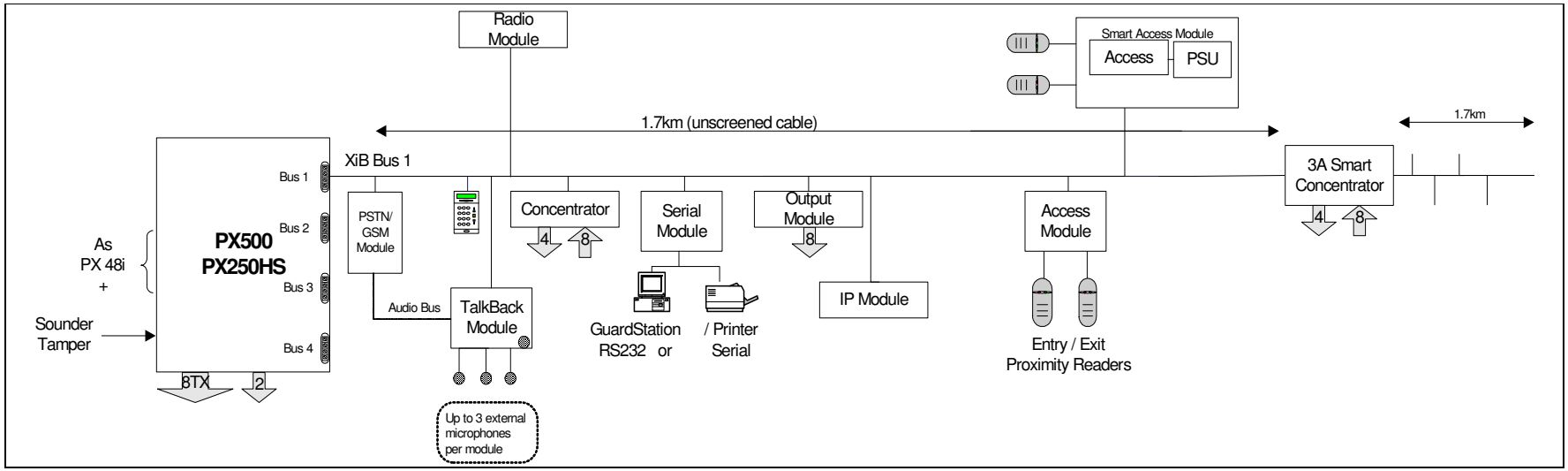
Technical Specification **RX16i/QX32i Bus Connections**



Technical Specification **PX48i/PX80i Bus Connections**



Technical Specification **PX500/PX250HS Bus Connections**



Technical Specification

Technical Specification — Environmental

Parameter	Range
Temperature range	-10 to 50 °C
Humidity	10% to 90% relative humidity

Technical Specification — Cable Type

The system has a 4-wire bus for all peripherals. The recommended cable type is 7-strand/0.2mm^2 diameter un-screened cable, which has a resistance of 90 ohms/km and a core to core capacitance of 85nF/km. The screened cable referred to in this manual has a capacitance of 68nF/km and a resistance of 39R/km. **If screened cable is used it should be terminated in the control panel and connected to earth.** Refer to the section on user interfaces and concentrators for details of the maximum length of cable on each bus.

Technical Specification — Cable Length

The maximum length, with a single standard keypad connected at the end of the cable and no other peripherals connected on the data bus, is shown in the table.

Maximum Data Bus Cable Length (m)		
Power Source	**Un-screened Cable**	**Screened Cable**
Control Panel	600m	1900m
Local Aux. PSU, with single 0v core	1700m	2500m
Local Aux. PSU, with 2 0v cores	1900m	2500m

If auxiliary PSUs are used then all 0v connections must be connected to the control panel 0-volt terminal. It is not recommended practice to share a sensor connection and the data bus connections in the same cable.

Technical Specification — Operation Voltage

The operating voltage range of all XiB components is shown in the table.

Parameter	Minimum	Typical	Maximum
Voltage (volts)	10.5 v	13.5 v	15 v

Voltage (Volts)	Condition
> 11.7	Battery OK
11.4	Low Volts
10.7	Power Fail
< 10.6	Deep discharge

Technical Specification **Current Consumption**

Product	Current (mA)
RX16i/QX32i	76
PX48i/PX80i	85
PX500/PX250HS	80
Keypad (standard)	28
Keypad with proximity	85
Mini keypad	80
Concentrator (8-input)	42
Concentrator (4-input)	25
3A Smart Concentrator	100
Output module	22 (all relays off)
Serial module	30
Access module	33
Proximity Reader	14
Bus isolator	25
Data comms Module	60
GSM/Dual Comm module	60 (standby) 125 (transmitting, strong signal present) 180 (transmitting, weak signal present)
PSTN module	50
Audio Bus Interface	Standby-6 Listen-6 Talk-10
Audio Bus Interface/Speech & Record	Standby-11 Playback-23 Record-32
TalkBack Module	Standby-26 Listen-41 Talk-62
Microphone Module	Standby-26 Listen-41
Microphone	Standby-5 Listen-15
Speech module	Standby-11 Playback-23 Record-32
Radio Module (Inovonics)	75
Radio Module (Visonic)	52

Technical Specification **Battery Standby**

The following example shows the average system current (excluding sensors) for a typical system at a supply voltage of 14 volts.

Product	RX16i/ QX32i	PX48i/ PX80i	PX500/ PX250HS
Panel	76	85	80
1 Keypad	28	28	28
1 Concentrator	42	42	42
Total (mA)	**146**	**155**	**150**

The table below shows the available auxiliary current for various battery sizes using the above typical system current.

The power supply standby capacity specified in PD6662:2004 is shown in the table.

Grade	1	2	3	4
Standby time (hours)	12	12	24	24

The following tables show the maximum available system current with a minimum of 12 hours standby for each combination of power supply and battery size.

RX16i/QX32i (with 1A PSU)					
24 hour battery re-charge time with a minimum 12 hours standby					
Battery Size	Maximum recharge current	System current maximum	Available backup period	RX16i/QX32i current (example system)	Available Current (For sensors etc.)
7 Ah	500mA	500mA	14 hours	146mA	354mA

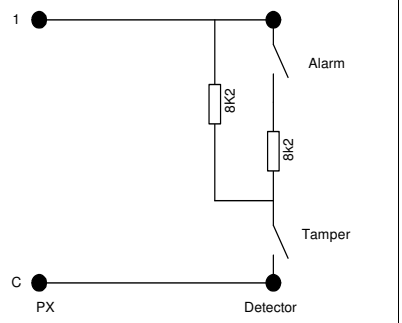
PX48i/PX80i (with 1.5A PSU)					
24 hour battery re-charge time with a minimum 12 hours standby					
Battery Size	Maximum recharge current	System current maximum	Available backup period	PX48i/PX80i current (example system)	Available Current (For sensors etc.)
7 Ah	750mA	580mA[1]	12 hours	155mA	425mA
12 Ah[2]	750mA	750mA	16 hours	155mA	595mA
17 Ah	750mA	750mA	22 hours	155mA	595mA
18 Ah	750mA	750mA	24 hours	155mA	595mA

PX500/PX250HS					
24 hour battery re-charge time with a minimum 12 hours standby					
Battery Size	Maximum recharge current	System current maximum	Available backup period	PX 500 current (example system)	Available Current (For sensors etc.)
7 Ah	780mA	580mA[1]	12 hours	150mA	430mA
12 Ah	780mA	1A[1]	12 hours	150mA	850mA
17 Ah	780mA	1.41A[1]	12 hours	150mA	1.26A
18 Ah	780mA	750mA[1]	24 hours	160mA	590mA

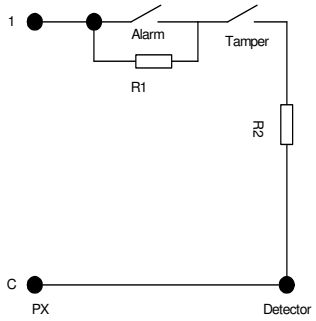
[1] Note that the maximum system current has been de-rated to provide the necessary standby capacity.

Technical Specification **EOL Resistor Connections**

Type 1 EOL Network (Guardall)



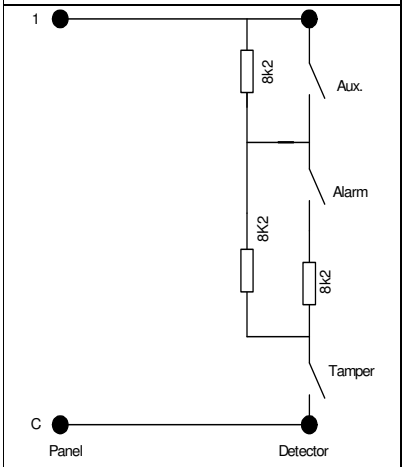
Type 2 EOL Network



The EOL resistors are fitted in the detector as shown. This wiring arrangement applies to all EOL inputs in the system.

Note: The diagram shows the default values of 8k2//8k2. The EOL resistor value can be programmed (Refer to the system options for details.).

EOL Network with Fault



The EOL resistors are fitted in the detector as shown. Note that the Guardall V12-AM detector has the necessary 3 EOL resistors fitted on board. For full information refer to the V12-AM manual.

A fault EOL resistor may only be used if the system is programmed to use the **standard Guardall resistor network**.

The resistance for each possible state is shown in the table and can be displayed using the circuit check mode function.

Circuit State	Nominal Resistance
Tamper	0k
Clear	4k1
Alarm	8k2
Aux (Fault)	12k3
Aux+Alarm (Mask)	16k4
Tamper	>20k

Diagnostics

Diagnostics — Accuracy

The accuracy of the diagnostic system is typically less than 1%, with a maximum error 2.5%. This accuracy can only be achieved by programming the correct value of the 5V-reference voltage (option 69 on the main menu).

Diagnostics — Supply Measurements

Parameter	Range	Resolution
Panel voltage	0-20v	78mV
Panel battery voltage	0-20v	78mV
System current	0-2A	7.8mA
Battery Current	0-1.1A	4.4mA
Battery standby capacity	See Note	1 hour
Concentrator current	0-250mA	1mA
Concentrator voltage	0-15V	58mV
Keypad voltage	0-15V	58mV
Circuit resistance (for 8k2 EOL)	0-20K	70R

Note: The displayed standby capacity will depend on the programmed battery size and the actual system current.

Diagnostics — XiB Comms LED

All XiB peripherals, except the keypad, have a green LED fitted, which is used to indicate the state of the XiB communications.

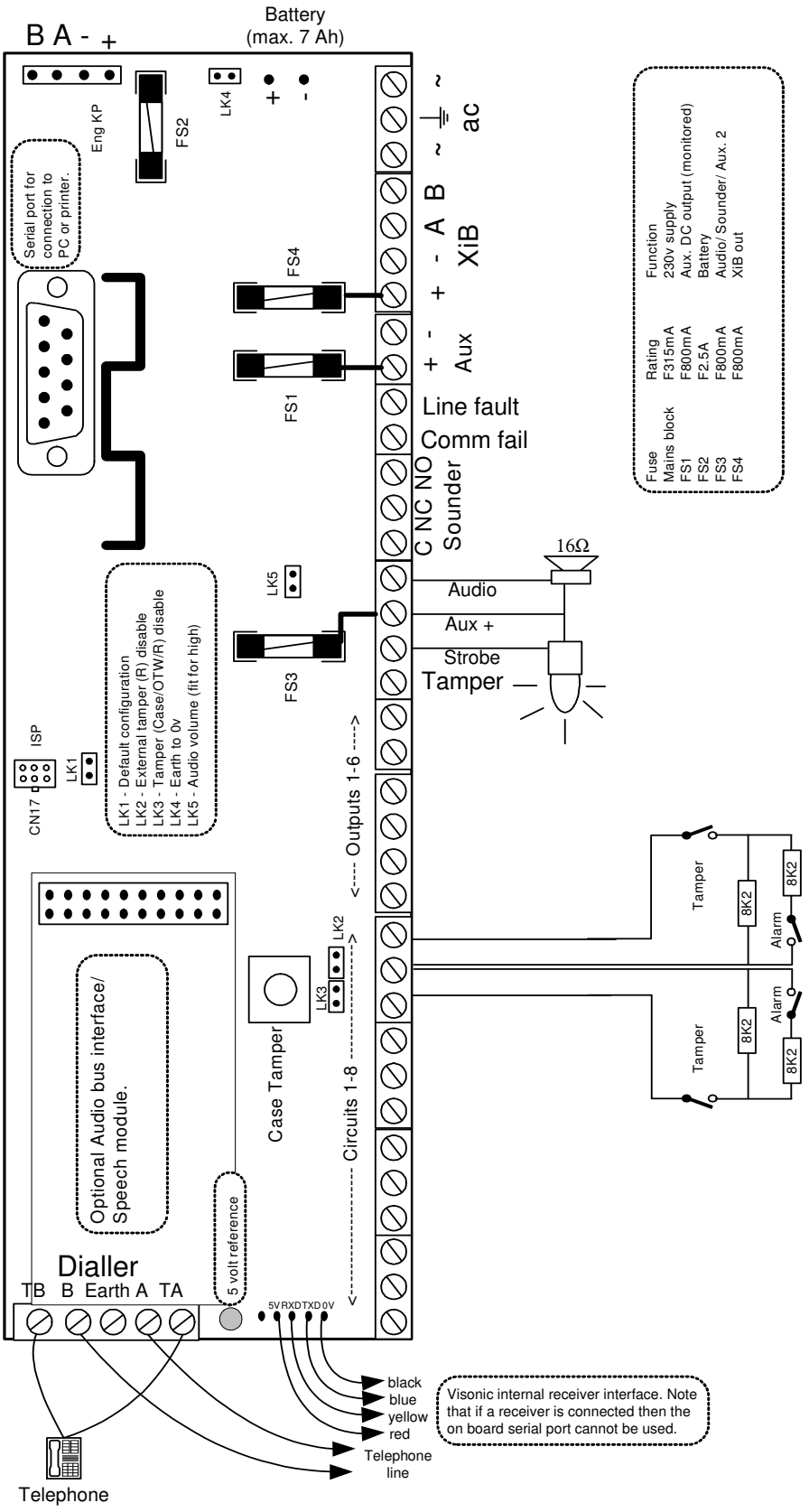
State	Meaning
OFF	No power
ON	Communication error
Slow FLASH	Operating normally
Quick FLASH	Resetting, or frequency of polling in a dialler, serial module or IP module

Diagnostics — Circuit Limits

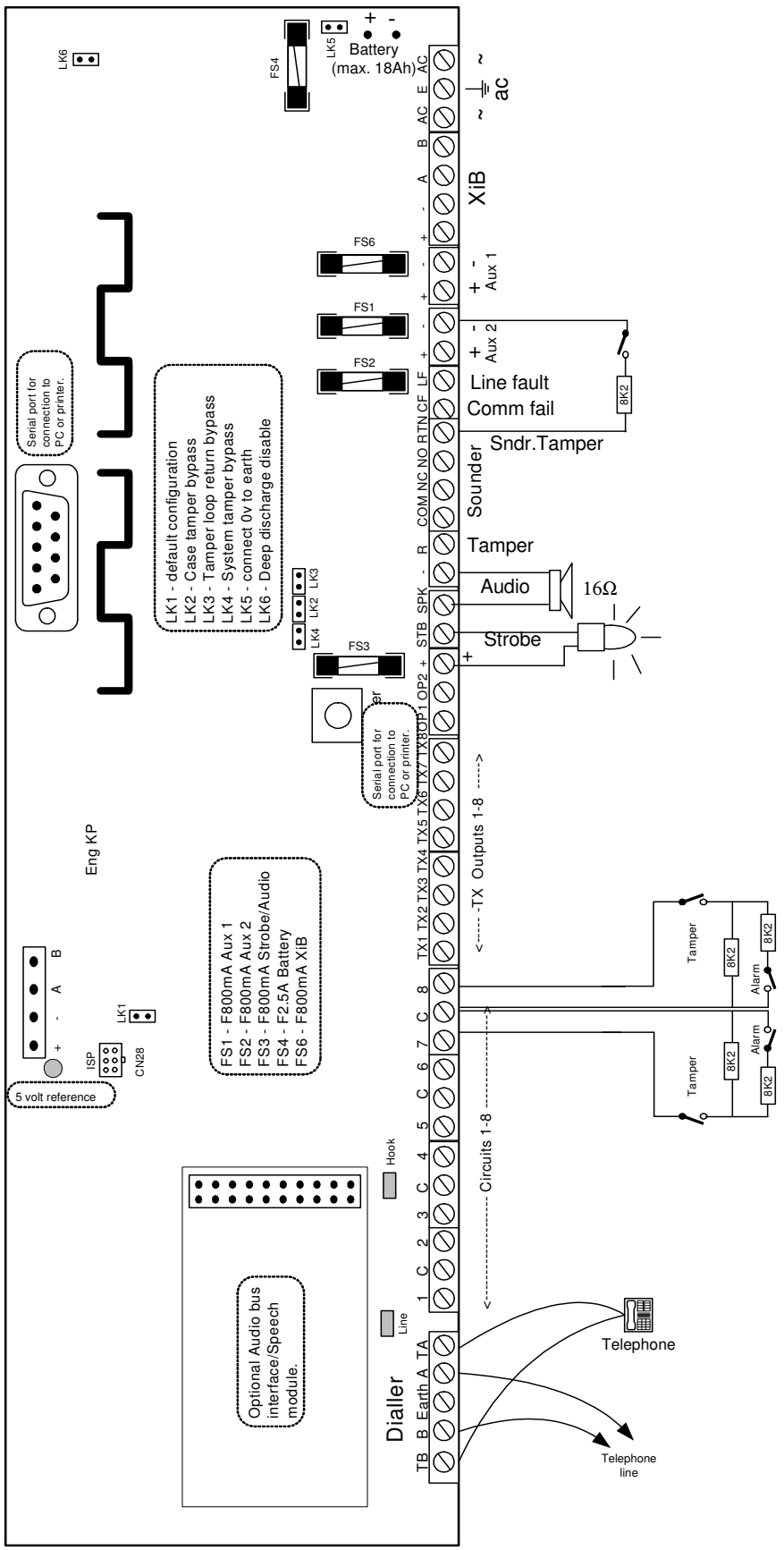
Option	Default	RX16i/QX32i/ PX48i/PX80i	Concentrator	Keypad	Access Module
Debounce time	200ms	2.2-500ms (inputs 1-3) 14-500ms (inputs 4-10)	2-500ms (inputs 1-4) 10-500ms (inputs 5-8)	200ms	200ms
Pulse count	0 (Off)	0-255	0-255	Not Applicable	Not Applicable
Pulse count period	2 secs	2-255 seconds	2-255 seconds	Not Applicable	Not Applicable
Tamper resistor	8k2	Programmable	Programmable	Programmable	8k2
Alarm resistor	8k2	Programmable	Programmable	Programmable	8k2
Alarm/Tamper threshold	30%	30-100	30-100	20%	20%

All percentages are with reference to the nominal programmed EOL value. The alarm and tamper EOL resistors are programmable. Refer to system options in the engineer manual for details.

RX16i/QX32i Control Unit



PX48i/PX80i Control Unit



PX500/PX250HS Control Unit

PX 80/500/HS Control Unit — Installation

The PX 500 control panel is supplied with a spares bag containing the following items:

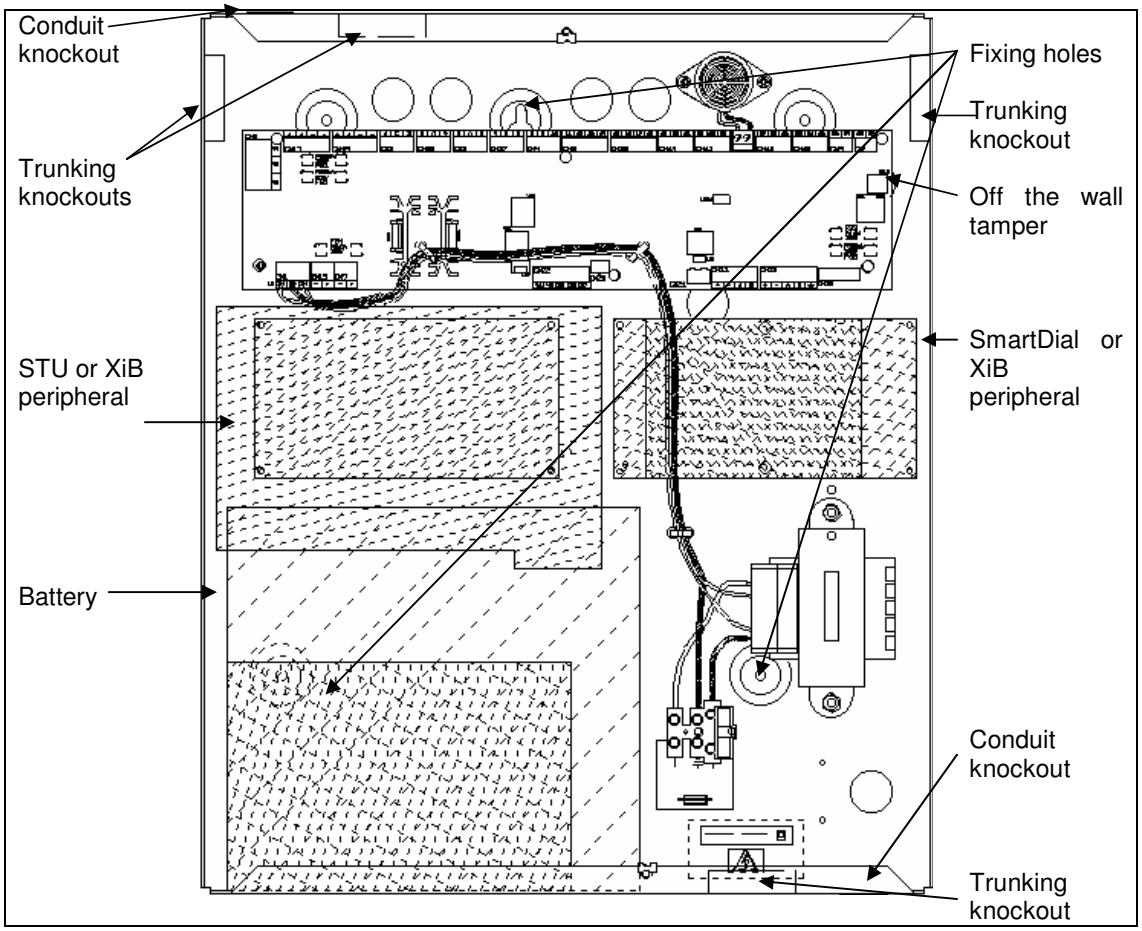
- Battery lead
- Cable clamp
- 2.5A fuse
- 800mA fuse x 6 (PX80) or x 8 (PX500/HS)
- Screw No 6 x 19mm
- 2 Screws No 6 x 9.5mm
- 2 ty-wraps
- 4 PCB stand-offs for fitting a XiB peripheral inside the case
- Various 2, 3, 4 and 5 way plug-on connectors
- 8k2 resistor x 2
- Thermistor cable assembly. (battery temperature compensation)

PX 80/500/HS Control Unit — Case Layout

Mark the fixing positions shown and secure the rear case to the wall using 3 suitable screws.

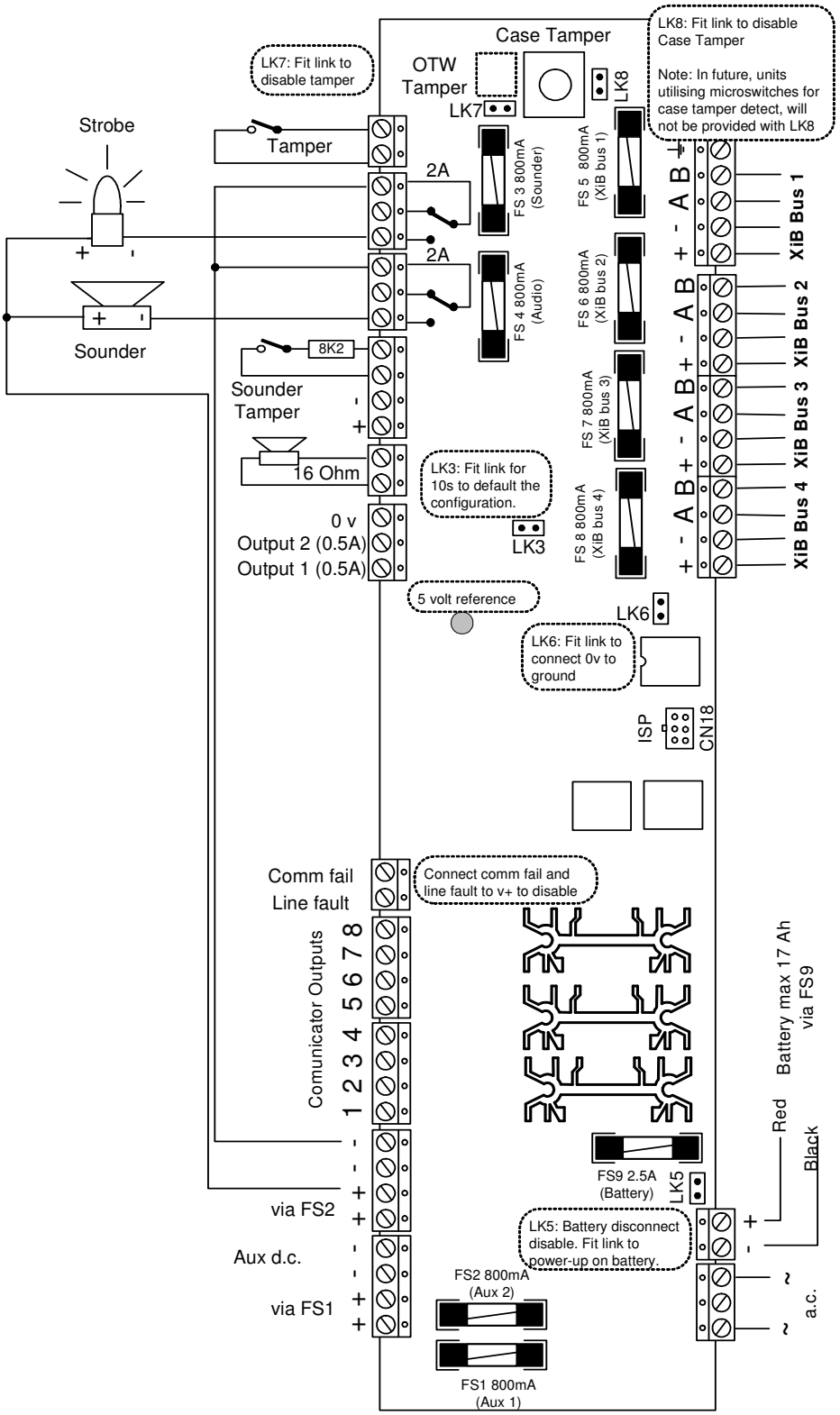
There are 2 x 20mm conduit knockout positions as indicated. The required cable entry point(s) should be knocked out from the **inside** prior to mounting the case.

There are 4 trunking knockouts. These can be knocked out from either side.



PX500/PX250HS **PCB Connections (PX500/PX250HS)**

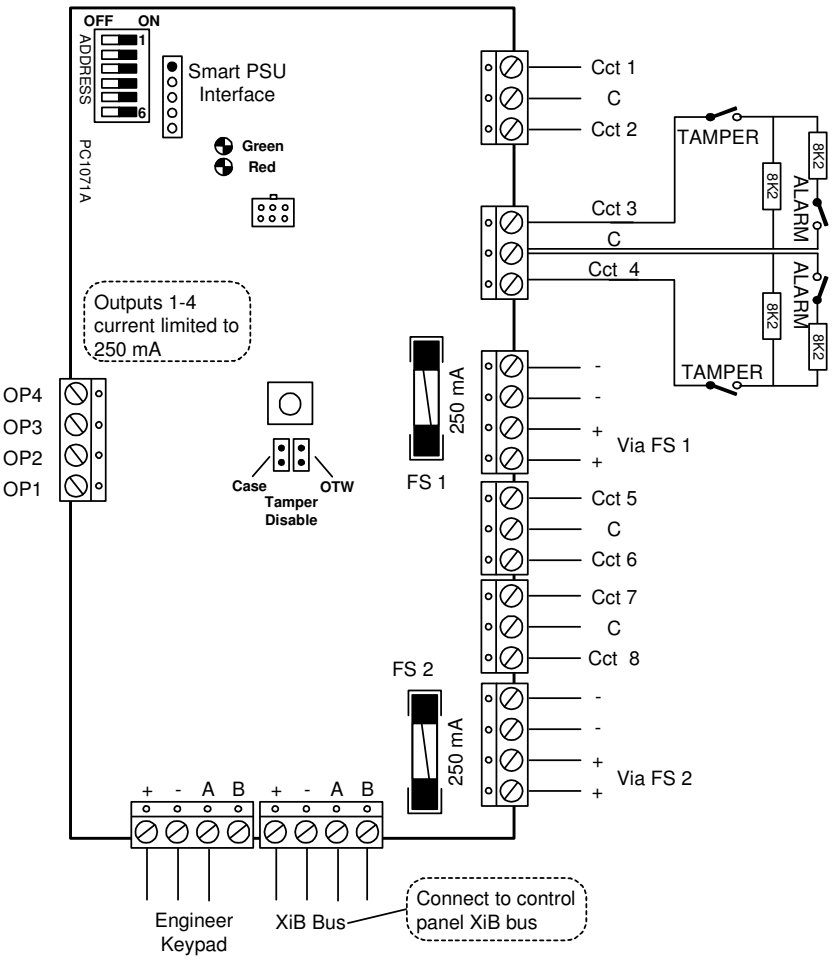
All PCB connections are plug-on screw down terminal blocks. The function and position of each terminal is described in the following page.



8 Input Concentrator

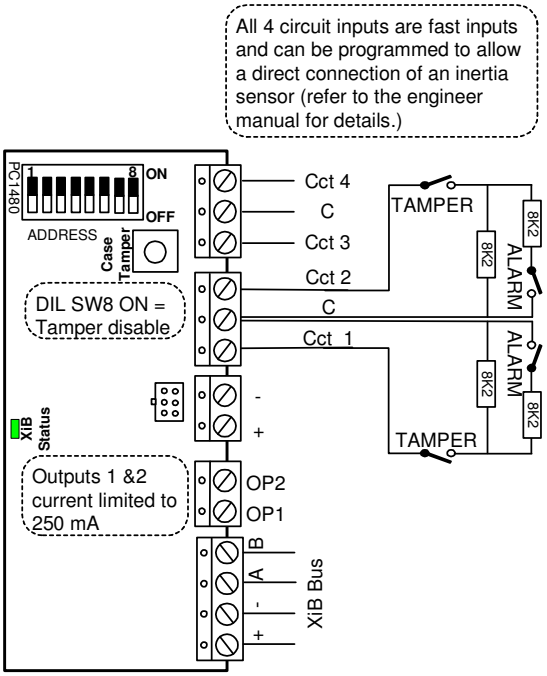
Address	DIL Switch
	6 5 4 3 2 1
1	0 0 0 0 0 0
2	0 0 0 0 0 1
3	0 0 0 0 1 0
4	0 0 0 0 1 1
5	0 0 0 1 0 0
6	0 0 0 1 0 1
7	0 0 0 1 1 0
8	0 0 0 1 1 1
9	0 0 1 0 0 0
10	0 0 1 0 0 1
11	0 0 1 0 1 0
12	0 0 1 0 1 1
13	0 0 1 1 0 0
14	0 0 1 1 0 1
15	0 0 1 1 1 0
16	0 0 1 1 1 1
17	0 1 0 0 0 0
18	0 1 0 0 0 1
19	0 1 0 0 1 0
20	0 1 0 0 1 1
21	0 1 0 1 0 0
22	0 1 0 1 0 1
23	0 1 0 1 1 0
24	0 1 0 1 1 1
25	0 1 1 0 0 0
26	0 1 1 0 0 1
27	0 1 1 0 1 0
28	0 1 1 0 1 1
29	0 1 1 1 0 0
30	0 1 1 1 0 1
31	0 1 1 1 1 0
32	0 1 1 1 1 1
33	1 0 0 0 0 0
34	1 0 0 0 0 1
35	1 0 0 0 1 0
36	1 0 0 0 1 1
37	1 0 0 1 0 0
38	1 0 0 1 0 1
39	1 0 0 1 1 0
40	1 0 0 1 1 1
41	1 0 1 0 0 0
42	1 0 1 0 0 1
43	1 0 1 0 1 0
44	1 0 1 0 1 1
45	1 0 1 1 0 0
46	1 0 1 1 0 1
47	1 0 1 1 1 0
48	1 0 1 1 1 1
49	1 1 0 0 0 0
50	1 1 0 0 0 1
51	1 1 0 0 1 0
52	1 1 0 0 1 1
53	1 1 0 1 0 0
54	1 1 0 1 0 1
55	1 1 0 1 1 0
56	1 1 0 1 1 1
57	1 1 1 0 0 0
58	1 1 1 0 0 1
59	1 1 1 0 1 0
60	1 1 1 0 1 1
61	1 1 1 1 0 0
62	1 1 1 1 0 1
63	1 1 1 1 1 0
64	1 1 1 1 1 1

Outputs 3&4 of 4-output concentrator may only be programmed on a contol panel fitted with version 3.10 or later.



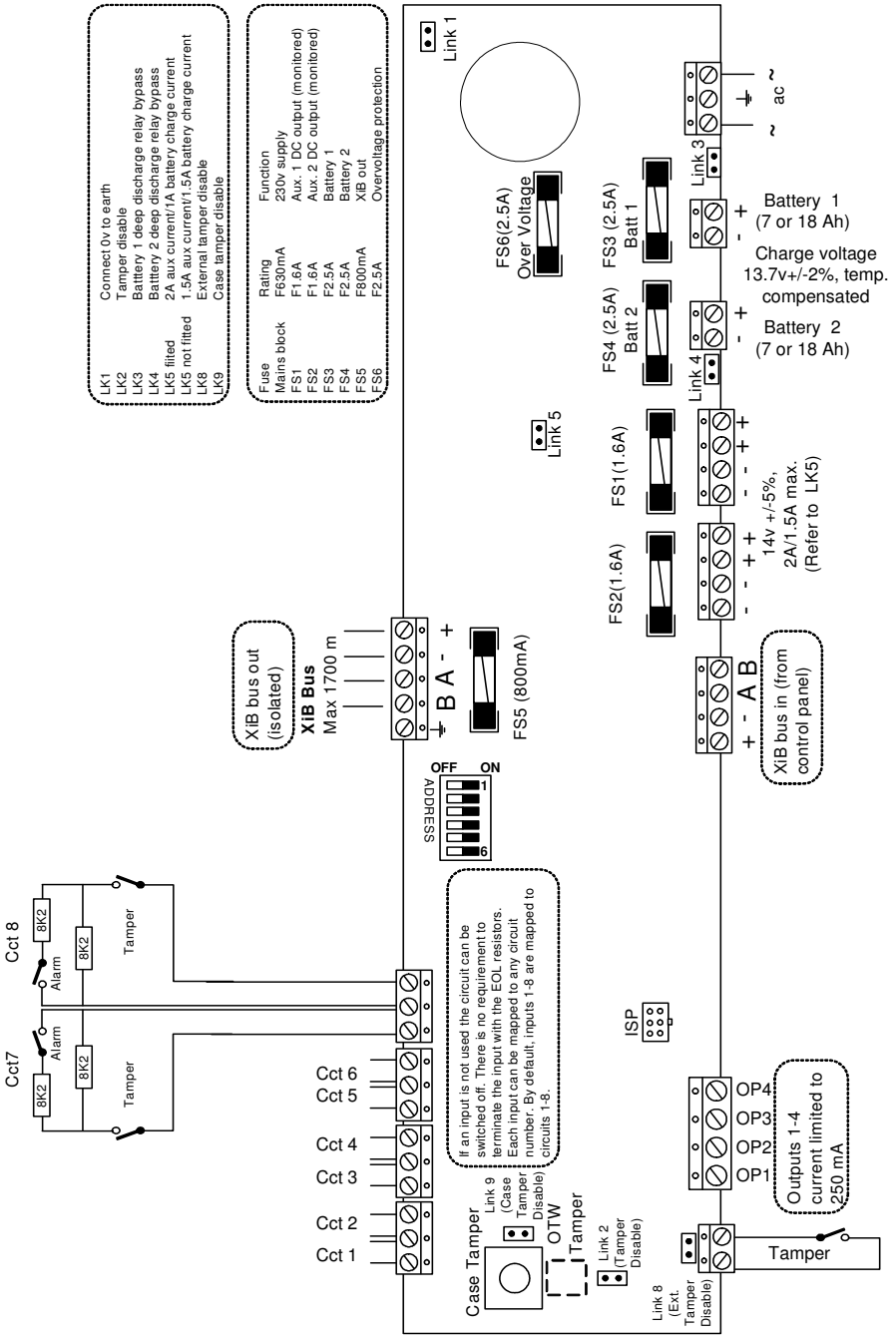
4 Input Concentrator

Address	DIL Switch	Address	DIL Switch
	7 6 5 4 3 2 1		7 6 5 4 3 2 1
1	0 0 0 0 0 0 0	65	1 0 0 0 0 0 0
2	0 0 0 0 0 0 1	66	1 0 0 0 0 0 1
3	0 0 0 0 0 1 0	67	1 0 0 0 0 1 0
4	0 0 0 0 0 1 1	68	1 0 0 0 0 1 1
5	0 0 0 0 1 0 0	69	1 0 0 0 1 0 0
6	0 0 0 0 1 0 1	70	1 0 0 0 1 0 1
7	0 0 0 0 1 1 0	71	1 0 0 0 1 1 0
8	0 0 0 0 1 1 1	72	1 0 0 0 1 1 1
9	0 0 0 1 0 0 0	73	1 0 0 1 0 0 0
10	0 0 0 1 0 0 1	74	1 0 0 1 0 0 1
11	0 0 0 1 0 1 0	75	1 0 0 1 0 1 0
12	0 0 0 1 0 1 1	76	1 0 0 1 0 1 1
13	0 0 0 1 1 0 0	77	1 0 0 1 1 0 0
14	0 0 0 1 1 0 1	78	1 0 0 1 1 0 1
15	0 0 0 1 1 1 0	79	1 0 0 1 1 1 0
16	0 0 0 1 1 1 1	80	1 0 0 1 1 1 1
17	0 0 1 0 0 0 0	81	1 0 1 0 0 0 0
18	0 0 1 0 0 0 1	82	1 0 1 0 0 0 1
19	0 0 1 0 0 1 0	83	1 0 1 0 0 1 0
20	0 0 1 0 0 1 1	84	1 0 1 0 0 1 1
21	0 0 1 0 1 0 0	85	1 0 1 0 1 0 0
22	0 0 1 0 1 0 1	86	1 0 1 0 1 0 1
23	0 0 1 0 1 1 0	87	1 0 1 0 1 1 0
24	0 0 1 0 1 1 1	88	1 0 1 0 1 1 1
25	0 0 1 1 0 0 0	89	1 0 1 1 0 0 0
26	0 0 1 1 0 0 1	90	1 0 1 1 0 0 1
27	0 0 1 1 0 1 0	91	1 0 1 1 0 1 0
28	0 0 1 1 0 1 1	92	1 0 1 1 0 1 1
29	0 0 1 1 1 0 0	93	1 0 1 1 1 0 0
30	0 0 1 1 1 0 1	94	1 0 1 1 1 0 1
31	0 0 1 1 1 1 0	95	1 0 1 1 1 1 0
32	0 0 1 1 1 1 1	96	1 0 1 1 1 1 1
33	0 1 0 0 0 0 0	97	1 1 0 0 0 0 0
34	0 1 0 0 0 0 1	98	1 1 0 0 0 0 1
35	0 1 0 0 0 1 0	99	1 1 0 0 0 1 0
36	0 1 0 0 0 1 1	100	1 1 0 0 0 1 1
37	0 1 0 0 1 0 0	101	1 1 0 0 1 0 0
38	0 1 0 0 1 0 1	102	1 1 0 0 1 0 1
39	0 1 0 0 1 1 0	103	1 1 0 0 1 1 0
40	0 1 0 0 1 1 1	104	1 1 0 0 1 1 1
41	0 1 0 1 0 0 0	105	1 1 0 1 0 0 0
42	0 1 0 1 0 0 1	106	1 1 0 1 0 0 1
43	0 1 0 1 0 1 0	107	1 1 0 1 0 1 0
44	0 1 0 1 0 1 1	108	1 1 0 1 0 1 1
45	0 1 0 1 1 0 0	109	1 1 0 1 1 0 0
46	0 1 0 1 1 0 1	110	1 1 0 1 1 0 1
47	0 1 0 1 1 1 0	111	1 1 0 1 1 1 0
48	0 1 0 1 1 1 1	112	1 1 0 1 1 1 1
49	0 1 1 0 0 0 0	113	1 1 1 0 0 0 0
50	0 1 1 0 0 0 1	114	1 1 1 0 0 0 1
51	0 1 1 0 0 1 0	115	1 1 1 0 0 1 0
52	0 1 1 0 0 1 1	116	1 1 1 0 0 1 1
53	0 1 1 0 1 0 0	117	1 1 1 0 1 0 0
54	0 1 1 0 1 0 1	118	1 1 1 0 1 0 1
55	0 1 1 0 1 1 0	119	1 1 1 0 1 1 0
56	0 1 1 0 1 1 1	120	1 1 1 0 1 1 1
57	0 1 1 1 0 0 0	121	1 1 1 1 0 0 0
58	0 1 1 1 0 0 1	122	1 1 1 1 0 0 1
59	0 1 1 1 0 1 0	123	1 1 1 1 0 1 0
60	0 1 1 1 0 1 1	124	1 1 1 1 0 1 1
61	0 1 1 1 1 0 0	125	1 1 1 1 1 0 0
62	0 1 1 1 1 0 1	126	1 1 1 1 1 0 1
63	0 1 1 1 1 1 0	127	1 1 1 1 1 1 0
64	0 1 1 1 1 1 1	128	1 1 1 1 1 1 1



3A Smart Concentrator

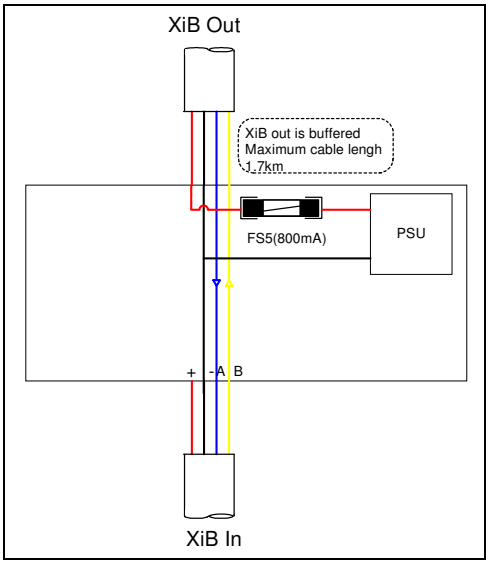
The 3A Smart concentrator can be used with a single battery or 2 batteries. If 2 batteries are used they should be of the same type and capacity. If a single battery is used it should be connected to the Batt 1 terminals. The case can accommodate 7Ah or 18Ah batteries. Deep discharge protection is provided for each battery.


LK1 Connect 0v to earth
LK2 Tamper disable
LK3 Battery 1 deep discharge relay bypass
LK4 Battery 2 deep discharge relay bypass
LK5 fitted 2A aux current/1A battery charge current
LK5 not fitted 1.5A aux current/1.5A battery charge current
LK8 External tamper disable
LK9 Case tamper disable
Fuse Rating Function
Mains block F630mA 230v supply
FS1 F1.6A Aux. 1 DC output (monitored)
FS2 F1.6A Aux. 2 DC output (monitored)
FS3 F2.5A Battery 1
FS4 F2.5A Battery 2
FS5 F800mA XiB out
FS6 F2.5A Overvoltage protection
Link 1
FS6(2.5A) Over Voltage
FS3 (2.5A) Batt 1
Link 3
~ ac ~
Battery 1 (7 or 18 Ah)
Charge voltage 13.7v+/-2%, temp. compensated
FS4 (2.5A) Batt 2
Battery 2 (7 or 18 Ah)
Link 4
Link 5
FS1(1.6A)
FS2(1.6A)
14v +/-5%, 2A/1.5A max. (Refer to LK5)
XiB bus out (isolated)
XiB Bus Max 1700 m
B A - +
FS5 (800mA)
XiB bus in (from control panel)
+ - A B
OFF ON
ADDRESS
1
6
Cct 8
8K2
Alarm
Tamper
Cct7
ISP
If an input is not used the circuit can be switched off. There is no requirement to terminate the input with the EOL resistors. Each input can be mapped to any circuit number. By default, inputs 1-8 are mapped to circuits 1-8.
Cct 6
Cct 5
Cct 4
Cct 3
Cct 2
Cct 1
OP4
OP3
OP2
OP1
Outputs 1-4 current limited to 250 mA
Case Tamper
Link 9 (Case Tamper Disable)
OTW
Tamper
Link 2 (Tamper Disable)
Link 8 (Ext. Tamper Disable)

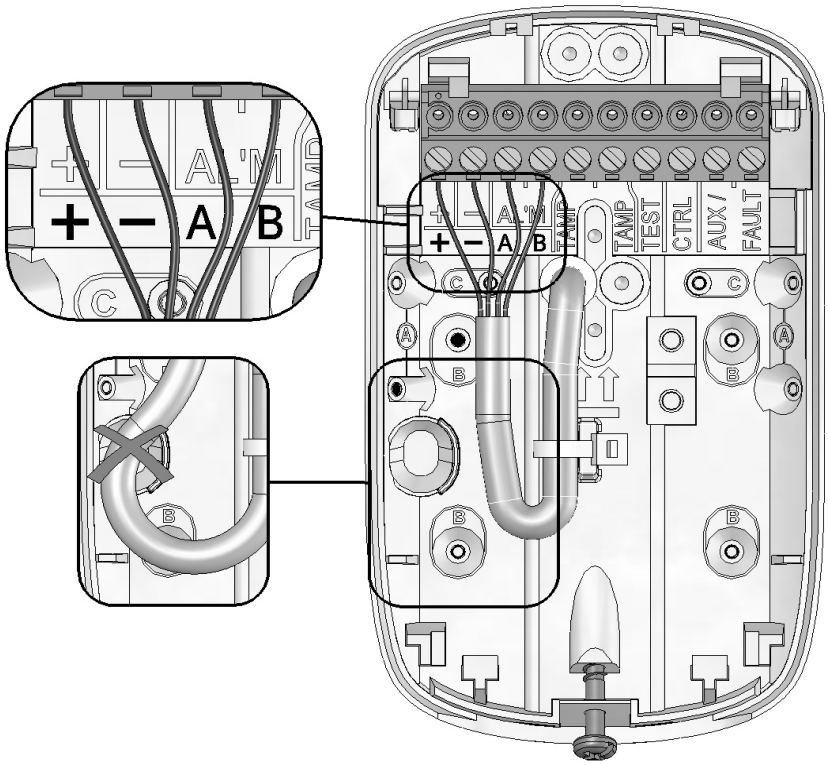
Address	DIL Switch
	6 5 4 3 2 1
1	0 0 0 0 0 0
2	0 0 0 0 0 1
3	0 0 0 0 1 0
4	0 0 0 0 1 1
5	0 0 0 1 0 0
6	0 0 0 1 0 1
7	0 0 0 1 1 0
8	0 0 0 1 1 1
9	0 0 1 0 0 0
10	0 0 1 0 0 1
11	0 0 1 0 1 0
12	0 0 1 0 1 1
13	0 0 1 1 0 0
14	0 0 1 1 0 1
15	0 0 1 1 1 0
16	0 0 1 1 1 1
17	0 1 0 0 0 0
18	0 1 0 0 0 1
19	0 1 0 0 1 0
20	0 1 0 0 1 1
21	0 1 0 1 0 0
22	0 1 0 1 0 1
23	0 1 0 1 1 0
24	0 1 0 1 1 1
25	0 1 1 0 0 0
26	0 1 1 0 0 1
27	0 1 1 0 1 0
28	0 1 1 0 1 1
29	0 1 1 1 0 0
30	0 1 1 1 0 1
31	0 1 1 1 1 0
32	0 1 1 1 1 1
33	1 0 0 0 0 0
34	1 0 0 0 0 1
35	1 0 0 0 1 0
36	1 0 0 0 1 1
37	1 0 0 1 0 0
38	1 0 0 1 0 1
39	1 0 0 1 1 0
40	1 0 0 1 1 1
41	1 0 1 0 0 0
42	1 0 1 0 0 1
43	1 0 1 0 1 0
44	1 0 1 0 1 1
45	1 0 1 1 0 0
46	1 0 1 1 0 1
47	1 0 1 1 1 0
48	1 0 1 1 1 1
49	1 1 0 0 0 0
50	1 1 0 0 0 1
51	1 1 0 0 1 0
52	1 1 0 0 1 1
53	1 1 0 1 0 0
54	1 1 0 1 0 1
55	1 1 0 1 1 0
56	1 1 0 1 1 1
57	1 1 1 0 0 0
58	1 1 1 0 0 1
59	1 1 1 0 1 0
60	1 1 1 0 1 1
61	1 1 1 1 0 0
62	1 1 1 1 0 1
63	1 1 1 1 1 0
64	1 1 1 1 1 1

XiB Busses

The 3A Smart Concentrator has 2 XiB connectors, XiB in and XiB out. The XiB in connector must be used to connect the XiB bus from the panel. All 4 wires may be connected but the XiB in + terminal is not connected to the XiB out + terminal. The XiB out connector is used to connect all XiB peripherals that are to be powered from the 3A Smart Concentrator. The XiB out bus is electrically isolated from the XiB in bus and peripherals can be connected on the XiB out bus up to 1.7km from the 3A Smart concentrator (at 9k6 baud).



XiB Detectors

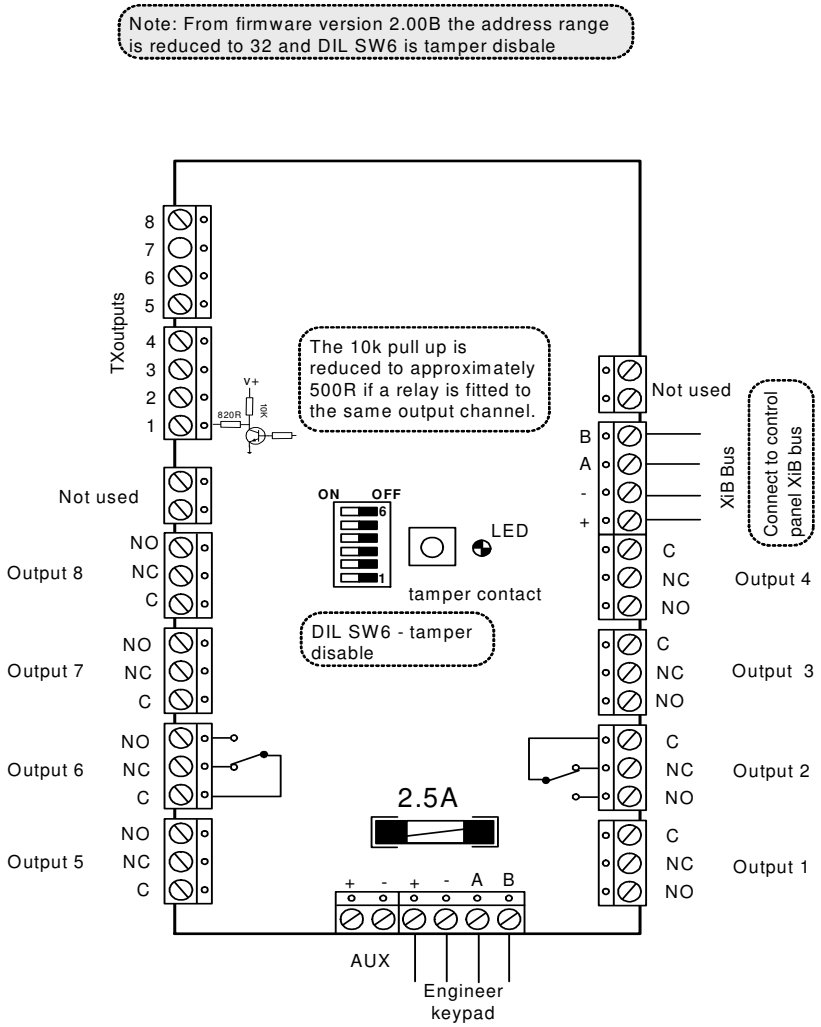


Refer to the relevant XiB Detector installation manual for the connection details

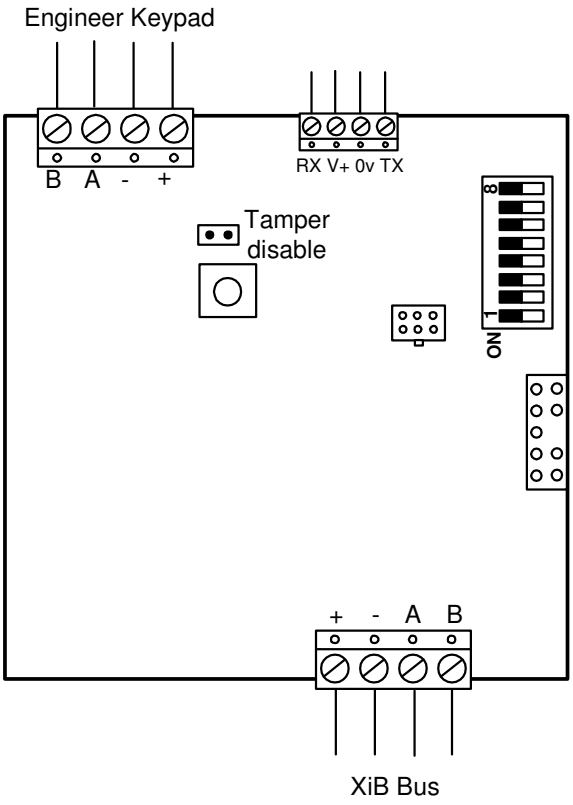
PQ15 XiB Manual	Part No: 321094
PQ15-AM XiB Manual	Part No: 321097
DT15+ XiB Manual	Part No: 321106
DT15-AM XiB Manual	Part No: 321113

Output Module

Address	DIL Switch
	5 4 3 2 1
1	0 0 0 0 0
2	0 0 0 0 1
3	0 0 0 1 0
4	0 0 0 1 1
5	0 0 1 0 0
6	0 0 1 0 1
7	0 0 1 1 0
8	0 0 1 1 1
9	0 1 0 0 0
10	0 1 0 0 1
11	0 1 0 1 0
12	0 1 0 1 1
13	0 1 1 0 0
14	0 1 1 0 1
15	0 1 1 1 0
16	0 1 1 1 1
17	1 0 0 0 0
18	1 0 0 0 1
19	1 0 0 1 0
20	1 0 0 1 1
21	1 0 1 0 0
22	1 0 1 0 1
23	1 0 1 1 0
24	1 0 1 1 1
25	1 1 0 0 0
26	1 1 0 0 1
27	1 1 0 1 0
28	1 1 0 1 1
29	1 1 1 0 0
30	1 1 1 0 1
31	1 1 1 1 0
32	1 1 1 1 1



Serial Module



Address	DIL Switch
	8 7 6 5 4 3 2 1
1	X X X X 0 0 0 0
2	X X X X 0 0 0 1

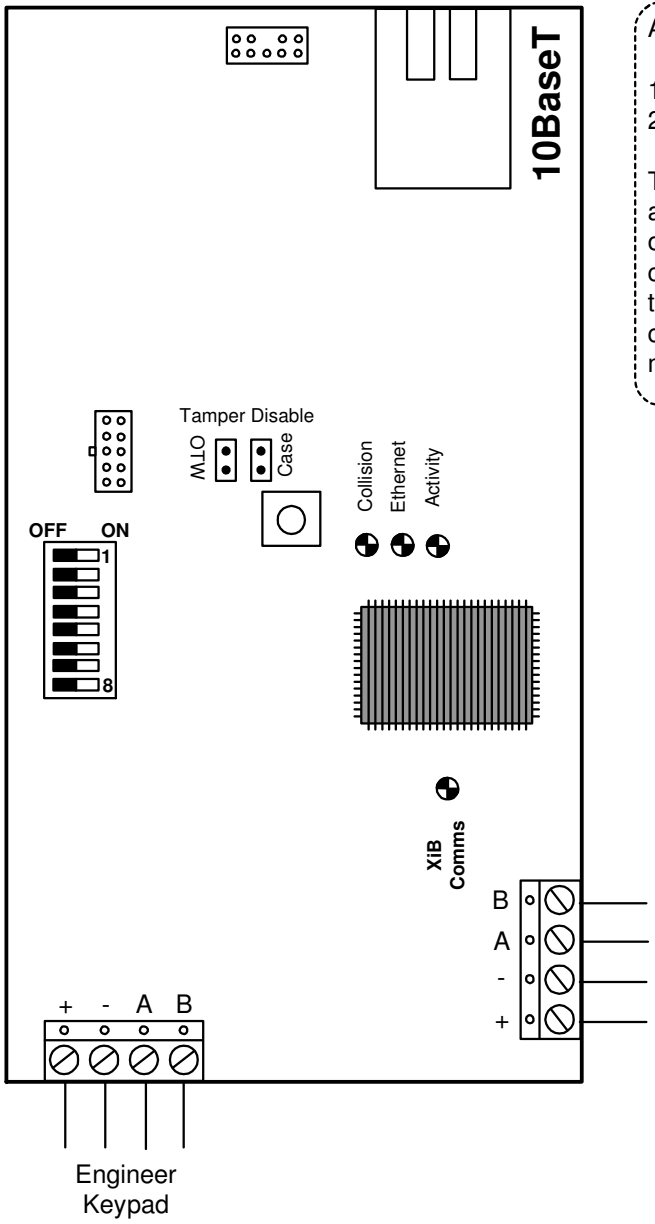
A serial module can be added at any time to a powered system but must be added to the system size before it will operate.

The function switches only apply to versions up to v3.20.

Function	DIL Switch
	8 7 6 5
Printer/PC	0 0 0 0
Printer	0 0 0 1
PC	0 0 1 0

The printer format is fixed at 1200 baud, no parity, 8 data bits and 1 stop bit.
PC baud rate is 9600.

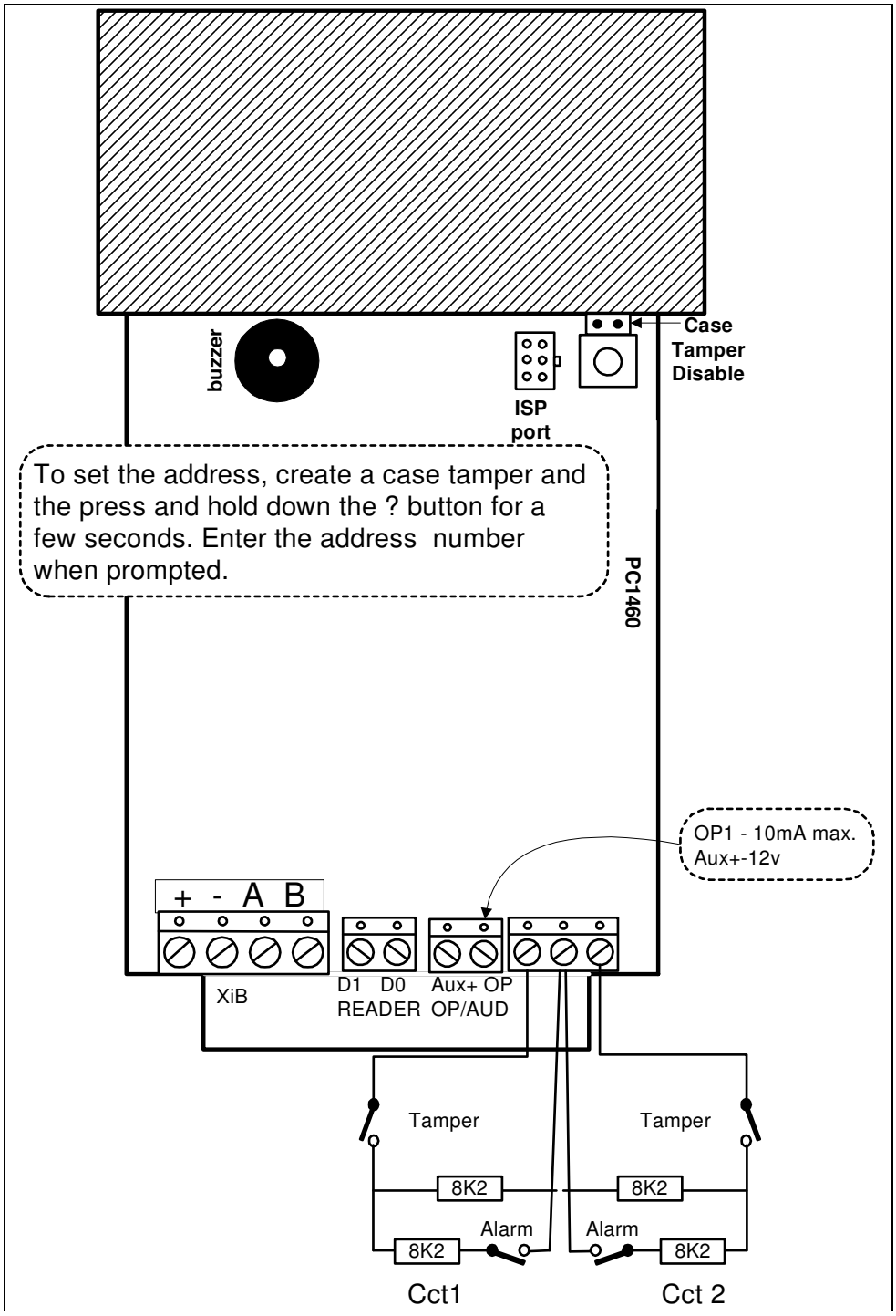
Data Comms Module



Address	DIL Switch
	8 7 6 5 4 3 2 1
1	0 0 0 0 0 0 0 0
2	0 0 0 0 0 0 0 1

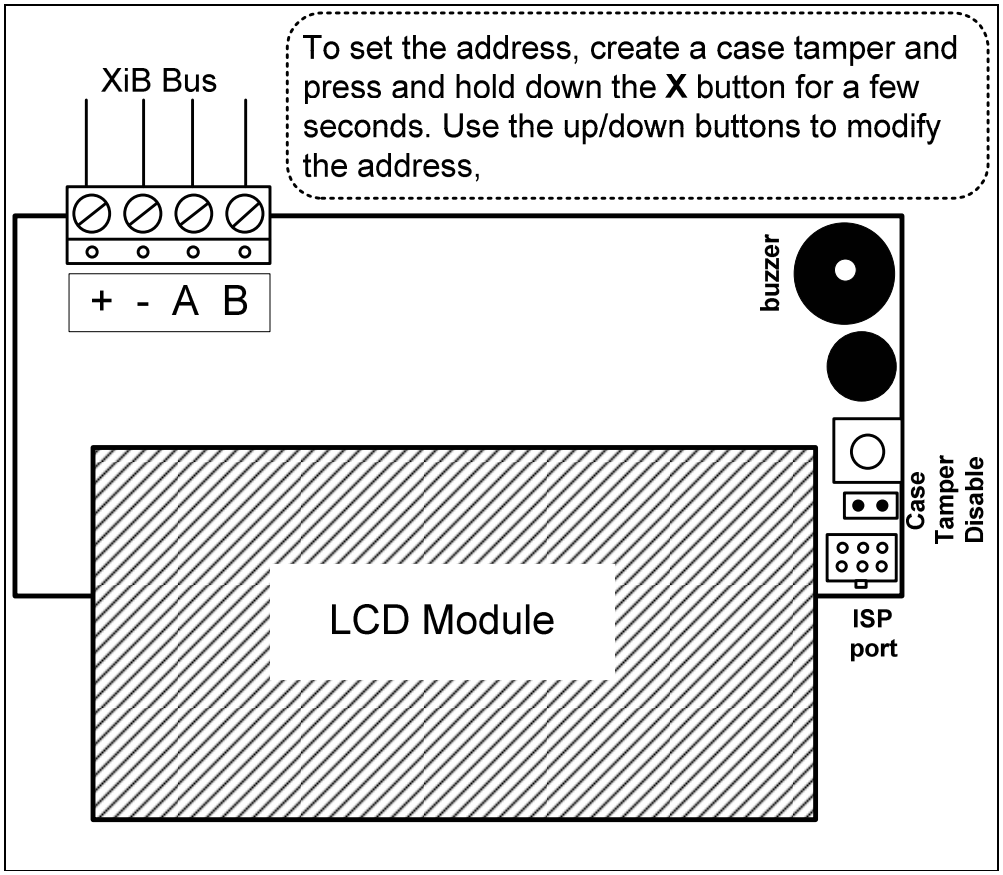
The data comms module address can be set to 1 or 2 only. If a serial module is connected to the system then the serial module and data comms module addresses must be unique.

Keypad


buzzer
Case
Tamper
Disable
ISP
port
To set the address, create a case tamper and the press and hold down the ? button for a few seconds. Enter the address number when prompted.
PC1460
OP1 - 10mA max.
Aux+-12v
+ - A B
XiB
D1 D0
READER
Aux+ OP
OP/AUD
Tamper
Tamper
8K2
8K2
Alarm
Alarm
8K2
8K2
Cct1
Cct 2

Mini Keypad

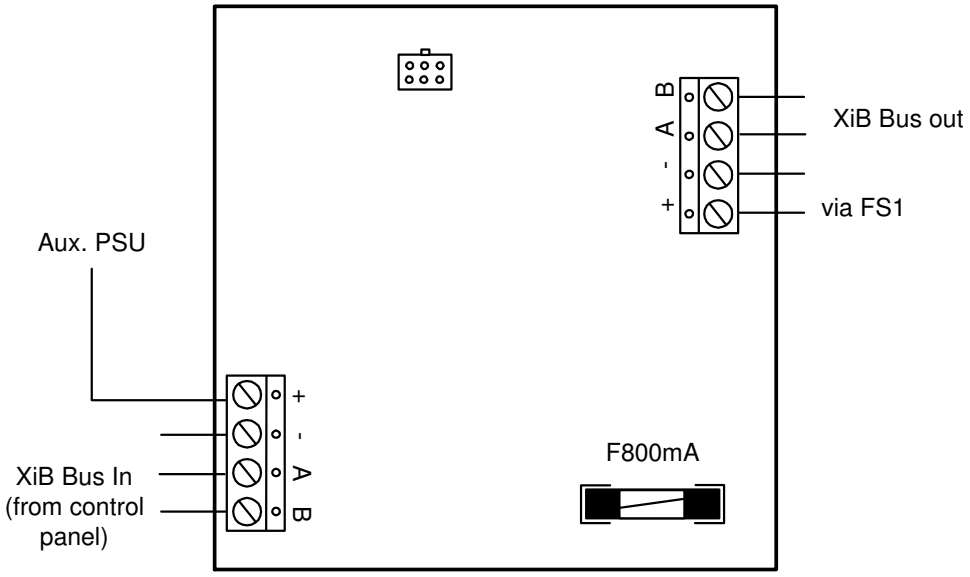
The mini LCD proximity keypad is supported from v4.20.


XiB Bus
To set the address, create a case tamper and press and hold down the **X** button for a few seconds. Use the up/down buttons to modify the address,
+ - A B
buzzer
Case Tamper Disable
LCD Module
ISP port

Bus Isolator

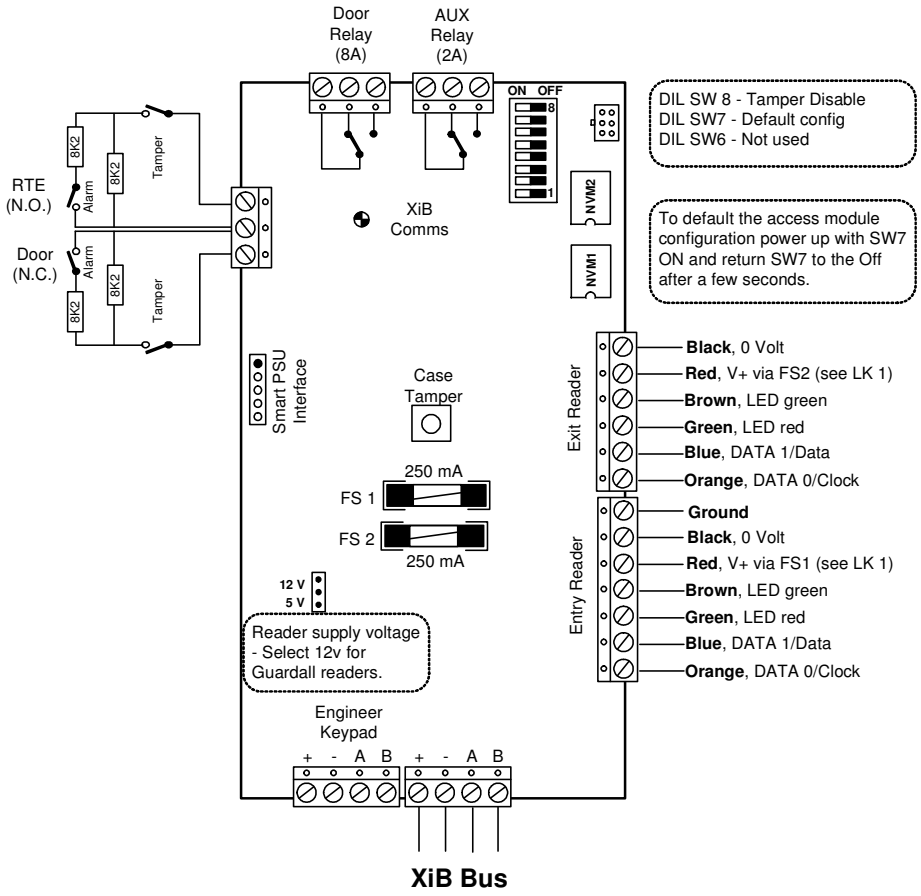
The XiB bus isolator can be used to both extend the maximum XiB cable length and to electrically isolate parts of the bus. The maximum bus extension will depend on the cable type and the supply voltage. Up to 2 bus isolators may be connected in series, giving a total bus length of 5.1km using standard un-screened cable. Refer to the Technical Specification section for the cable specification.

Bus Isolator **PCB Connections**



Access Module

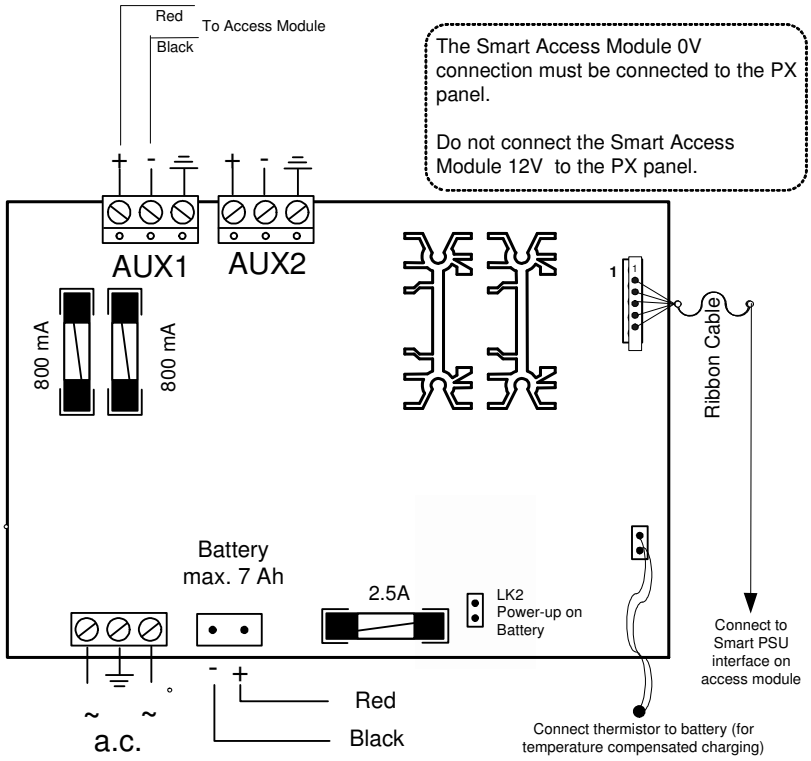
Address	DIL Switch
	5 4 3 2 1
1	0 0 0 0 0
2	0 0 0 0 1
3	0 0 0 1 0
4	0 0 0 1 1
5	0 0 1 0 0
6	0 0 1 0 1
7	0 0 1 1 0
8	0 0 1 1 1
9	0 1 0 0 0
10	0 1 0 0 1
11	0 1 0 1 0
12	0 1 0 1 1
13	0 1 1 0 0
14	0 1 1 0 1
15	0 1 1 1 0
16	0 1 1 1 1
17	1 0 0 0 0
18	1 0 0 0 1
19	1 0 0 1 0
20	1 0 0 1 1
21	1 0 1 0 0
22	1 0 1 0 1
23	1 0 1 1 0
24	1 0 1 1 1
25	1 1 0 0 0
26	1 1 0 0 1
27	1 1 0 1 0
28	1 1 0 1 1
29	1 1 1 0 0
30	1 1 1 0 1
31	1 1 1 1 0
32	1 1 1 1 1



Access Module

Smart Access Module

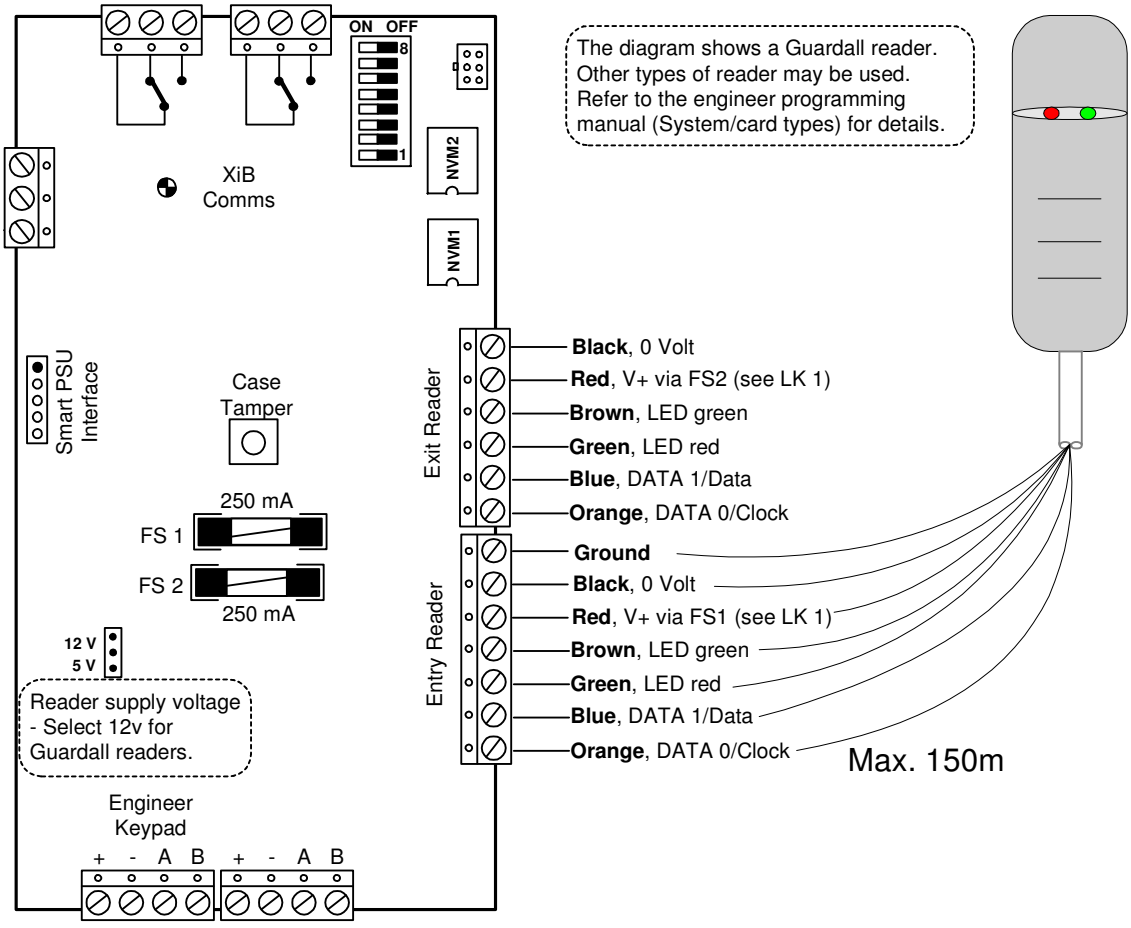
The smart access module includes a standard access module PCB and a power supply PCB. Only the power supply PCB is shown in the diagram.



Proximity Reader

The Proximity Reader is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. Whilst it operates on a non-harmonised frequency of 125KHz, it meets all relevant harmonised standards. It has been notified in the following EU countries: Belgium, Italy, France, The Netherlands, Denmark, Finland, UK, Ireland, Germany, Spain, Portugal, Norway, Greece and Sweden.

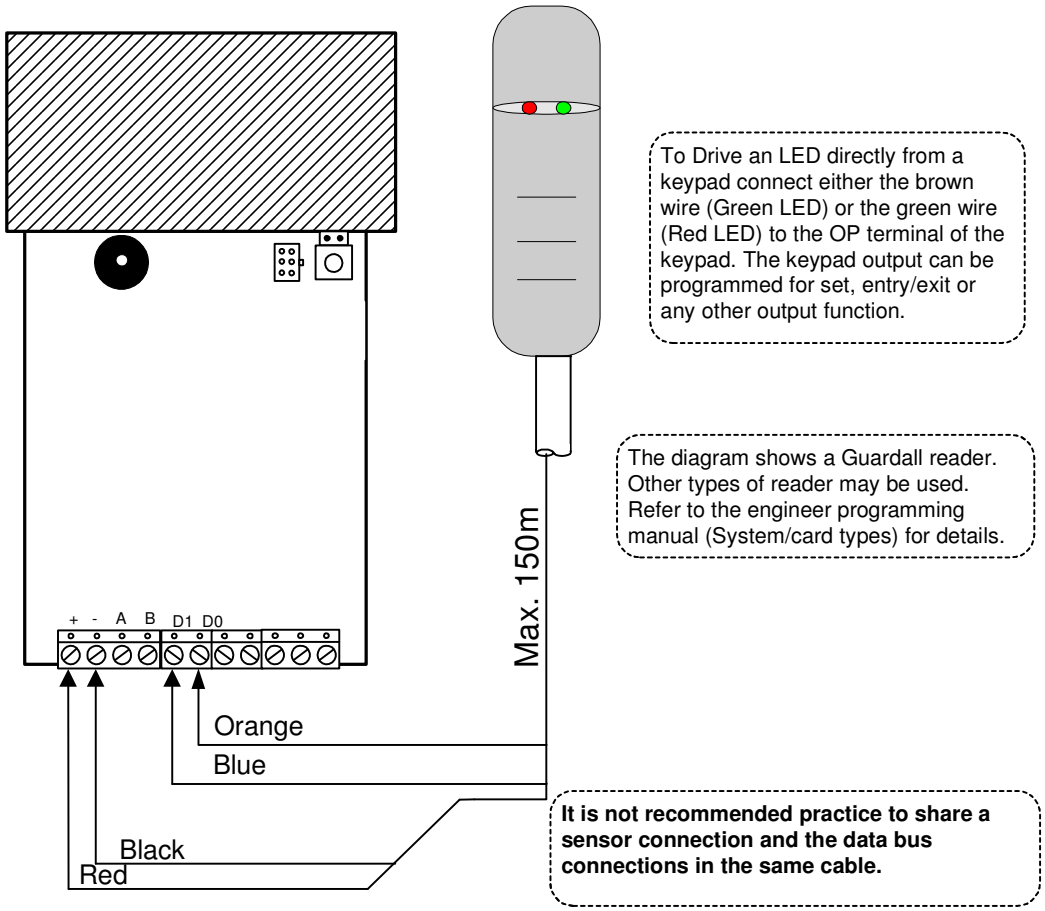
Proximity Reader **Access Module Connections**



Proximity Reader	LEDs

Function	Red LED	Green LED
Door LOCKED	ON	OFF
Door UNLOCKED	ON	ON
INVALID card, Access DENIED or Access ACCEPTED but door not opened.	Flash for approximately 2 seconds	OFF
Access ACCEPTED, Area not in alarm	ON	ON (when door open and locked, flash on for 1 second)
Access ACCEPTED, Area was in alarm	Flash for approximately 2 seconds	ON
Door FORCED Alarm	Flash	ON
Door TAMPER Alarm	Flash	ON
Door area set	OFF	blink for 10 secs, then goes to Door Locked
Door OPEN Alarm Start / Finish	Flash (4 sec's)	ON (4 sec's)
Door area setting	Slow flash on both LEDs	
Module logging data or undergoing configuration	Fast flash	OFF
Lock out (continuous)	Blink on both LEDs	

Proximity Reader **Keypad Connections**



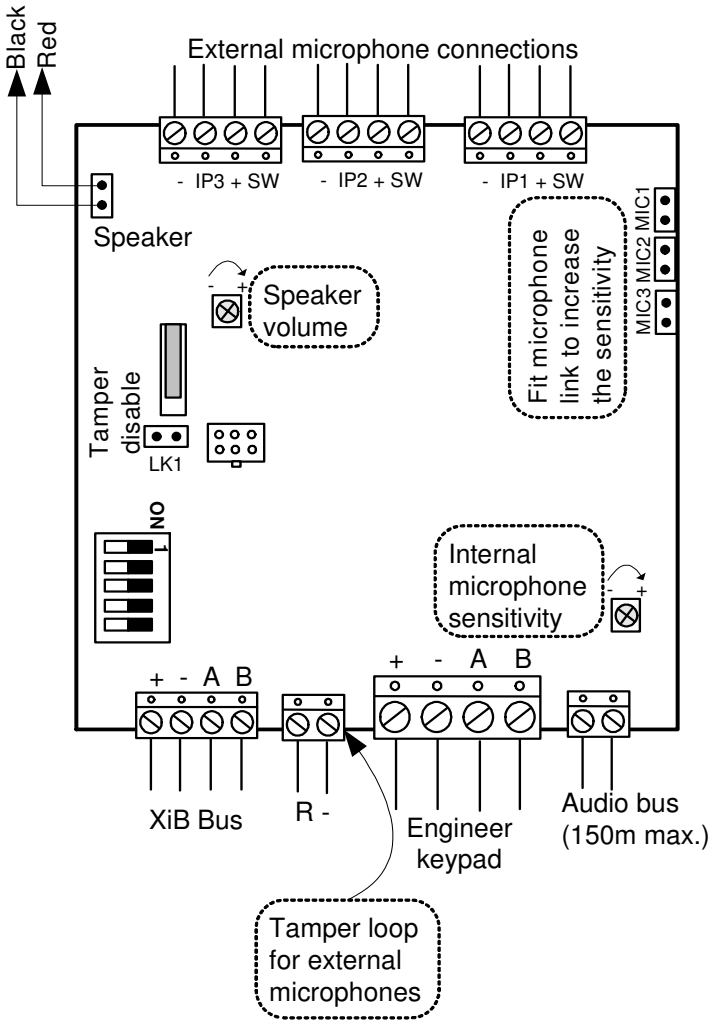
To Drive an LED directly from a keypad connect either the brown wire (Green LED) or the green wire (Red LED) to the OP terminal of the keypad. The keypad output can be programmed for set, entry/exit or any other output function.

The diagram shows a Guardall reader. Other types of reader may be used. Refer to the engineer programming manual (System/card types) for details.

It is not recommended practice to share a sensor connection and the data bus connections in the same cable.

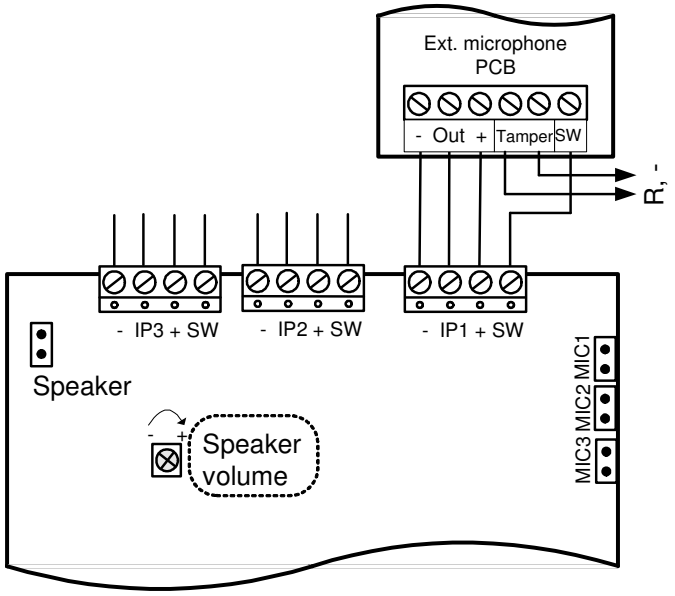
Audio Module

Address	DIL Switch
	5 4 3 2 1
1	0 0 0 0 0
2	0 0 0 0 1
3	0 0 0 1 0
4	0 0 0 1 1
5	0 0 1 0 0
6	0 0 1 0 1
7	0 0 1 1 0
8	0 0 1 1 1
9	0 1 0 0 0
10	0 1 0 0 1
11	0 1 0 1 0
12	0 1 0 1 1
13	0 1 1 0 0
14	0 1 1 0 1
15	0 1 1 1 0
16	0 1 1 1 1
17	1 0 0 0 0
18	1 0 0 0 1
19	1 0 0 1 0
20	1 0 0 1 1
21	1 0 1 0 0
22	1 0 1 0 1
23	1 0 1 1 0
24	1 0 1 1 1
25	1 1 0 0 0
26	1 1 0 0 1
27	1 1 0 1 0
28	1 1 0 1 1
29	1 1 1 0 0
30	1 1 1 0 1
31	1 1 1 1 0
32	1 1 1 1 1



Audio System	Connecting an External Microphone

Up to 3 external microphones can be connected to each audio module. The sensitivity of each external microphones can be increased by fitting the appropriate link (MIC1, MIC2 or MIC3) on the audio module PCB.

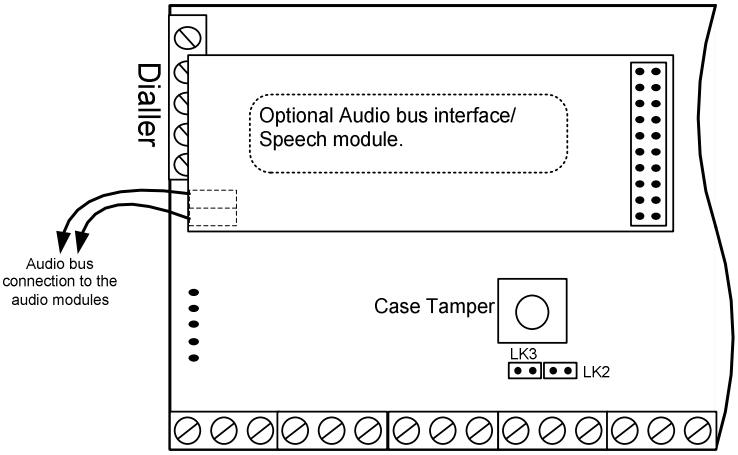


Audio System	Connecting the Audio Bus Interface

The Audio Bus Interface (ABI) can be fitted, along with an Audio Module, to provide audio capability to the system.

For systems requiring the ability to record and playback messages, a speech module is fitted in place of an ABI.

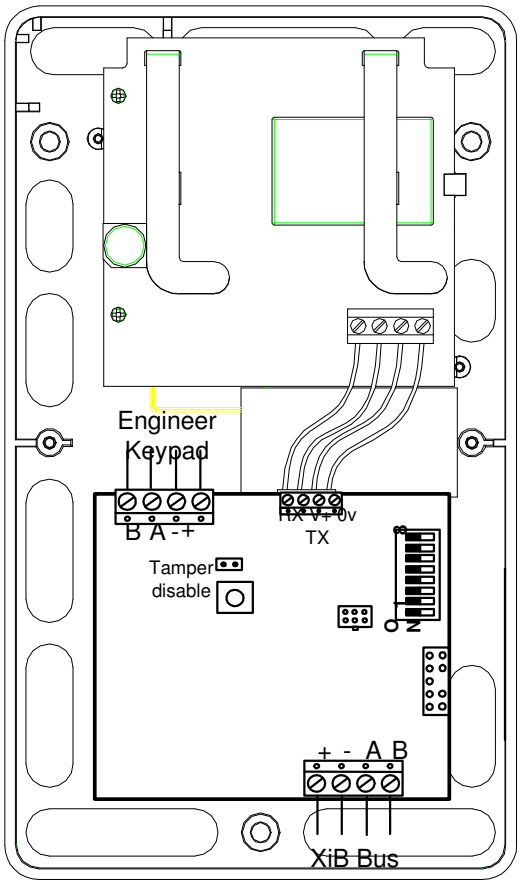
Either board should be fitted with the power removed from the Control Panel. Power should only be restored after the alignment of the two boards has been checked.



Radio Module

The radio module is fitted with 2 PCBs; a RF module and a serial interface for connection to the control panel XiB bus. The serial interface PCB is multi-function and for operation as a radio interface DIL switches 6 and 8 must be on and DIL switch 7 off. DIL switches 1-5 are used to select the radio module address. The diagram shows the Inovonics receiver module (W76067). The Visonic radio module (W76110) internal layout is similar. Refer to the serial module section for the connection details.

The radio module type must be programmed. Refer to the radio options in the engineer manual for more information.



DIL switches 6-8 are factory set to the radio module function

Function	DIL Switch 8 7 6
Radio	1 0 1

Radio Repeater

A radio repeater(s) may be added to the system. Each radio repeater should be added as a transmitter (refer to the engineer manual for details).

GSM/Dual Comm module

Statutory Requirements

Hereby Guardall, declares that the Dual comm module and PSTN module is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

If you have any doubts concerning the suitability, connection or uses of this apparatus then consult a suitably qualified person before continuing.

SUITABILITY FOR USE

The apparatus has been designed to work on all European analogue networks. It provides the following facilities:

1. Alarm transmission and transmission/reception of configuration data.
2. Automatic Call Initiation.
3. Series connection.
4. Dial tone Detection
5. Automatic dialling using DTMF tones.
6. Automatic Call Answering.
7. Stored number dialling.
8. Timed Break Register Recall.

It is not suitable for connection to PABX systems or for use as an extension to a payphone.

The Dual comm module and the GSM module are fitted with a GSM engine which has been declared compliant with the essential requirements of Directive 1995/05/EC by the manufacturer Dia telecom Spa (Telit). The conformity assessment procedure referred to in Article 10 and detailed in Annex IV of Directive 1999/05/EC was carried out by a Notified Body, namely BABT, Walton-on-Thames, UK (Notified body number 0168).

The GSM engine complies with the following standards:

- EN301511, 3GPP51.010-1 – GSM (Radio Spectrum) standard
- EN301489-1 & EN301489-7 – EMC Standard
- BS EN60950:2002 - Safety of information equipment

Introduction

The Dual Comm module, GSM module and the PSTN module may be used with any Guardall control panel.

Feature	Implementation
Transmission	Voice and Data
Frequency Band	Dual Band EGSM900 and EGSM1800
Transmit Power	Class 4 (2W) for EGSM 900MHz Class 1 (1W) for EGSM 1800MHz
Data	9.6Kbps
Supported SIM card	3V cards

There are a number of important points to consider when using one of the new module types with an existing panel:

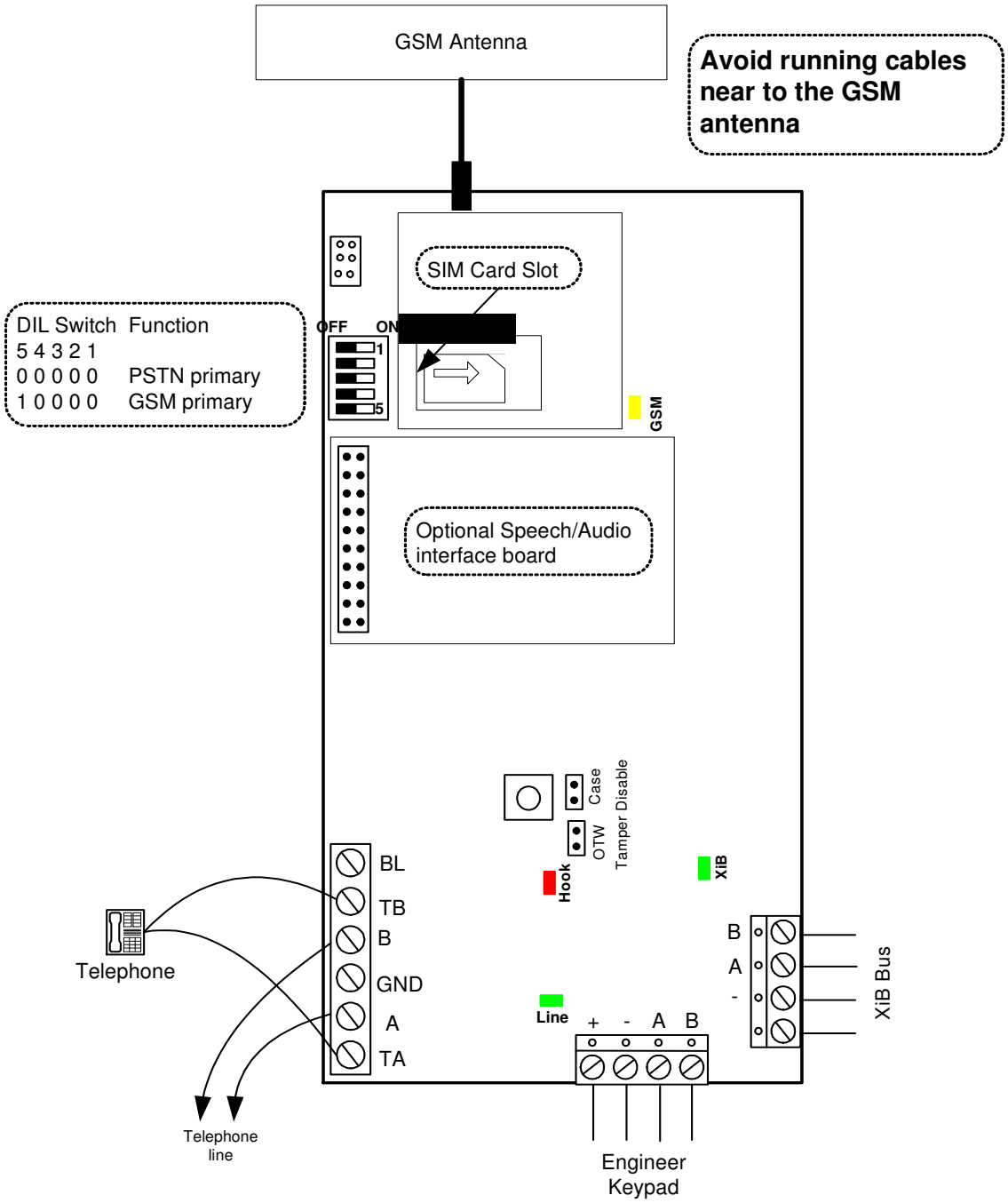
1. All previous communicators were designed for use within the panel case and consequently they were designed with no tamper switch. The GSM/Dual comm module is intended for use outside the panel case, and so needs a case tamper. The GSM/Dual comm module case tamper is recognised from panel v4. If the GSM/Dual comm module used with earlier panel versions it is recommended that line fault monitoring is enabled to act as a substitute for the tamper sensing.
2. The Dual comm module functions are programmed using the DIL switches. Future versions of the firmware will include additional menu options for GSM programmable functions.

The version number of the first release of firmware is v4.50. This is necessary to enable older panel versions to recognise the module and allow access to the appropriate programming menus

Installation

Special care is required when installing the GSM module or Dual Comm module;

1. Avoid placement on metal surfaces to ensure good radio performance.
2. To minimise GSM transmission interference, route **all** cables away from the GSM antenna.
3. If the system includes Audio Modules ensure that there is at least 3m between the Audio Module(s) and the GSM/Dual Comm module.
4. The maximum recommended XiB bus cable length between the power supply and the GSM/Dual Comm module is approximately 80m. This distance may be doubled if two cable cores are used for the power connections. This restriction is based on the peak current requirement of 180mA under poor signal conditions.
5. Insert a valid SIM card into the slot provided in the GSM engine. **SIM code password protection must be disabled.**



When power is applied to the system the GSM module will power up in 3 stages:

1. The XiB communications will start before the end of system settling time (as indicated on the keypad). During this phase the XIB-comms LED will flash rapidly (awaiting secondary PSU start-up)
2. The GSM engine will start up after about 20 seconds. During this phase the XIB-comms LED will flash approximately once per second.
3. Once powered up, the GSM engine will be configured automatically and will attempt to acquire a service connection. This phase may take several minutes and no GSM calls should be attempted during this phase.

LEDs

Function	Colour	State	Meaning
XiB Comms	Green	OFF	No power
		ON	Communication error
		Slow FLASH	Operating normally
		Quick FLASH	Active
Hook	Red	ON	Line seized
Line monitor	Green	ON	Valid Exchange voltage level present
GSM Status	Yellow	Quick flash	Network search
		Slow flash	Registered
		ON	Active call

Reporting Formats

The available reporting formats for each route is shown in the table.

Formats	Route		
	PSTN	GSM (audio)	GSM (data)
Contact ID	✓	✓	✗
ADEMCO Fast/Superfast Format	✓	✓	✗
SIA Level 3	✓	✓	✗
CESA (French panel variants only)	✓	✓	✗
Speech (if optional module fitted, v3.21 or later)	✓	✓	✗
Audio (if optional module fitted)	✓	✓	✗
PS/2 (GSR) - 1200 baud	✓	✗	✗
PS/2 (GSR) - 9600 baud	✗	✗	✓
SMS (v4.00 or later)	✗	✓	✓

DIL Switches

To enable the Dual Comm module to be used with existing panels, the primary and secondary communicator routes are selected by DIL switch 5. DIL switches 1-4 are reserved for future use.

DIL Switch 5 4 3 2 1	Function
0 0 0 0 0	PSTN is primary route
1 0 0 0 0	GSM is primary route

The primary route is the normal route for all calls.

If the primary route is PSTN then;

- All calls in all formats will be routed over the PSTN network
- If there is a PSTN line fault then all calls will be routed over the GSM network (refer to the reporting formats table for details)

Note: If the call format is PS/2 and there is a PSTN line fault then the call will be made on the same number of GSM. This call will fail as the Windsor modem and GSM modem will use different telephone numbers.

If the primary route is GSM then;

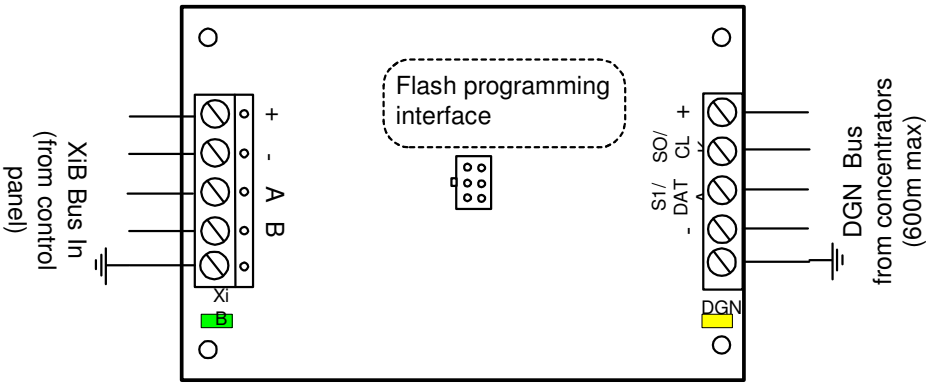
- All calls in all formats will be routed over the GSM network
- If there is no GSM service available then all calls will be routed over the PSTN network (refer to the reporting formats table for details)

DGN Interface

The DGN (**D**ata **G**athering **N**etwork, the name of the concentrator bus used in Windsor 500/700) to XiB interface enables Vigil or Windsor 500 DGN concentrators to be connected to any XiB control panel (PX or QX). The XiB control panel must support the number of circuits and concentrators on the DGN bus (see table). The interface also allows DGN concentrator daughter board outputs to be controlled by the XiB control panel. If daughter boards are fitted to the DGN concentrators then the XiB control panel must be capable of supporting a corresponding number of output modules. Only one interface can be used in a system.

The DGN supports anti-substitution and will report a concentrator tamper if a DGN concentrator is substituted with a concentrator with the same address.

It is recommended that the DGN interface be mounted inside the control panel case using the supplied adhesive pads. The XiB connector of the DGN interface can be connected to any of the panel XiB busses and can share the bus with other XiB peripherals. Connect the bus cables from the concentrators to the DGN bus connections. Note that the order of the DGN bus connections may not be the same as the order of connections on the concentrators. (The DGN concentrator will have terminals marked CLK/DATA or S0/S1.)



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